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TREATMENT RESEARCH MONOGRAPH SERIES

INDICATORS OF SUICIDE AND DEPRESSION AMONG DRUG ABUSERS

1979-1981 TOPS Admission Cohorts

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Alcohol, Drug Abuse, and Mental Health Administration

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1979-1981 TOPS Admission Cohorts

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This research was conducted for the National Institute on Drug Abuse as part of the Treatment Outcome Prospective Study (TOPS), under contract number 271-79-3611 with Research Triangle Institute, Research Triangle Park, North Carolina. Harold Ginzburg, M.D., M.P.H., served as the NIDA Project Officer.

Respondents in this survey were asked about the use of various drugs. Trade and proprietary names were used in some questions because it was thought the drugs were most recognizable by these names. The use of trade or proprietary names in this report does not imply that the U.S. Government endorses or favors any specific commercial product.

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PREFACE

Depressive symptoms and suicidal thoughts and attempts are commonly noted among psychiatric patients. Depression has been associated with feelings of hopelessness and the inability to cope with environmental stresses. These feeelings frequently occur among drug users and abusers entering drug abuse treatment programs. Clients entering these programs, whether for the first time or the fifth, have personal difficulties as well as difficulties with their families, friends, or employers. They may be having medical, legal, or financial problems as well.

Drug abusers are a heterogenous population, with varying drug use patterns and a variety of demographic characteristics. What they have in common, however, is the inability to exist without psychoactive substances. The data presented in this report are derived from interviews with clients at their admission to treatment, during treatment, and subsequent to their termination from treatment. These clients participated in a national study, the Treatment Outcome Prospective Study (TOPS), a large-scale, long-term longitudinal study of clients entering drug abuse treatment programs during calendar years 1979 - 1981. TOPS collected admission and in-treatment data on more than 11,000 clients in methadone detoxification, methadone maintenance, drug-free outpatient, and drug-free residential (therapeutic community) treatment programs. One-year and 2-year posttreatment followup interviews were collected on a stratified random sample of the 1979 cohort. Ninety-day and 1-year posttreatment followup interviews were collected on a stratified random sample of the 1980 cohort.

Indicators of Suicide and Depression Among Drug Abusers provides a comprehensive overview of depressive symptoms reported by drug abuse treatment clients before, during, and after treatment. The data are based on a three-item measurement of depressive symptoms, suicidal thoughts, and suicide attempts. Through the use of risk ratio calculations and time trend analyses, this report also demonstrates the effectiveness of treatment in dealing with depressive symptoms and suicidal thoughts and attempts. Finally, the report correlates changes in the levels of depression with treatment service utilization. Improvements in mental health may result in improved outcomes for clients who enter drug abuse treatment programs. The report provides a critical foundation for better understanding the relationships between symptoms of mental illness and drug use.

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EXECUTIVE SUMMARY

The Treatment Outcome Prospective Study (TOPS), conceptualized and supported by the National Institute on Drug Abuse, is a large-scale longitudinal study of more than 11,000 clients who entered public outpatient methadone detoxification and methadone maintenance, drug-free outpatient (OPDF), and drug-free residential (therapeutic community), treatment programs during calendar years 1979, 1980, and 1981. Demographic and baseline outcome variable data were collected at treatment intake. Intreatment outcome data were collected at months 1 and 3, and then quarterly for as long as the client remained in treatment. A random stratified sample by time in treatment was drawn from the 1979 cohort, and these clients were interviewed approximately 1 and 2 years after treatment termination. A second stratified sample, drawn from the 1980 cohort, was interviewed approximately 3 months and 1 year after termination from treatment. A third stratified sample for followup has been drawn from the 1981 cohort; these clients are being interviewed 4 to 5 years after leaving treatment.

Previous research established a clear link between drug use and depression, both in the general population and among drug abusers. This report focuses on describing the nature, extent, treatment, course, and correlates of drug abusers' depression symptoms before, during, and after drug abuse treatment. A three-item scale asking about inability to get out of bed because of depression, suicidal thoughts and suicide attempts was developed for the survey instruments. A validation study comparing the three-item scale used in TOPS with three clinically established depression scales (Beck, DES-D, and Koss and Butcher MMPI Subscale) indicates this brief summary measue is a valid and useful indicator of depression and suicide.

PREVALENCE OF DEPRESSION SYMPTOMS

About 60 percent of TOPS clients reported experiencing at least one depression symptom in the year before treatment. The most susceptible group was females under 21 years of age: nearly 75 percent reported one or more depression symptoms. Prevalence rates varied somewhat across treatment modalities. In all three cohorts, about half of the detoxification and methadone clients reported a symptom compared to two-thirds of the residential or OPDF clients. Only about one in 20 detoxification or methadone clients reported a suicide attempt compared to one in 10 residential or OPDF clients.

CORRELATES OF DEPRESSION SYMPTOMS

Other characteristics, such as being female, white, and using multiple non-narcotic drugs, were risk factors for suicidal thoughts and attempts regardless of the modality. In methadone programs, referral from a source other than the criminal justice system and three or more prior treatment episodes were key risk factors. In residential programs, use of heroin with other narcotics and referral from the community agency increased the risk of suicidal symptoms. In outpatient drug-free programs, self-referral or referral from a source other than the criminal justice system increased the risk of reporting suicidal symptoms.

DRUG-RELATED PROBLEMS AND TREATMENT OF DEPRESSED AND SUICIDAL CLIENTS

The profiles of the suicidal group also showed that large numbers of clients with low risk factors (such as male clients aged 21-30) reported suicidal symptoms. A further complication for diagnosis and treatment is the extensive array of drug-related problems reported by clients in general and, in particular, those with depression symptoms. In all modalities, clients who reported one or more depression symptoms in the year before treatment also reported more medical, psychological, family/friend or job/school problems than symptom-free clients. When the nature of services reported by these clients was examined, psychological services were the only type of service which was clearly more likely to be delivered to depressed or suicidal clients.

PATTERNS AND CORRELATES OF DEPRESSION SYMPTOMS DURING TREATMENT

During the first 3 months in treatment, depression symptoms were reported less often than in the year before treatment. Although some of the difference is obviously due to the more restricted 3-month time period, the remission rates are still impressive. However, a number of clients continued to report depression symptoms during treatment and a small proportion of clients who were symptom-free before treatment became depressed during treatment.

A number of factors appeared to be related to reporting suicidal thoughts or attempts during the first 3 months of treatment. Clearly, suicidal thoughts or attempts in the year before treatment were major risk factors. After controlling for the pretreatment depression symptoms, white clients still were at greater risk than black clients, especially in residential programs. The comparative risk for males and females during treatment, however, was not significantly different.

PATTERNS AND CORRELATES OF DEPRESSION SYMPTOMS AFTER TREATMENT

The lower levels of suicidal thoughts or attempts achieved during treatment appeared to be maintained after treatment in all the modalities. Although there is substantial improvement, about 10-25 percent of clients still reported suicidal symptoms in all posttreatment periods. Approximately 2-3 percent reported suicide attempts. Thus, although treatment appeared to help reduce depression, depression continued to be a problem for a large number of clients.

As expected, pretreatment suicidal thoughts or attempts were the major risk factor. The depression symptom "could not get out of bed" was not related to posttreatment suicidal symptoms. Time in treatment or extent of services was not found to be related to posttreatment suicidal symptoms. The importance of three other risk factors varied by modality. In OPDF, whites

had a higher risk of suicidal symptoms than blacks. Clients in residential and OPDF with three or more prior treatments were also at higher risk for posttreatment suicidal symptoms. Readmission to treatment after TOPS was a significant risk factor for residential clients.

More detailed knowledge of the course of treatment and the factors that affect that course may suggest more effective approaches to dealing with depression and suicidal thoughts and attempts.

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1. INTRODUCTION

Higher levels of drug use have been associated with higher reports of depression symptoms (Gilbert and Lombardi 1967; Penk et al. 1979; Robins 1974; Sutker 1971). Depression has been found to be common among applicants to a variety of drug abuse treatment programs including those in VA hospitals (Harris et al. 1979), therapeutic communities (DeLeon 1974, 1984; Zuckerman et al. 1975), and methadone programs (Frederick et al. 1973; Weissman et al. 1976). In general, 30 to 50 percent of clients entering drug abuse treatment programs could be diagnosed as at least moderately depressed. These findings compare with estimates that 14-20 percent of the general population experience depression symptoms at any given time (Midanik 1981; President's Commission on Mental Health 1978), and 4-7 percent of the general population may be diagnosable as having clinical depression (Weissman et al. 1978). Data from the Epidemiological Catchment Area (ECA) surveys indicate a 6-month prevalence of a major depressive episode in the general population of about 1 percent in the St. Louis and Baltimore sites and nearly 4 percent in the New Haven site (Myers et al. 1984). In addition, Miles (1977) has estimated that 10 percent or more of opiate addicts will die by suicide. Thus, it is clear that depression, whether a cause or an effect of drug abuse, is a positively correlated phenomenon.

The effects of drug abuse treatment on depression remain unclear. In a long-term study of drug abusers (Dorus and Senay 1980), scores on depression scales decreased substantially regardless of the type of substance abuse or the duration of treatment. Woody and Blaine (1979) reported that high levels of depression at intake decreased over time, although suicide attempts were more common during withdrawal phases of treatment. It is apparent, then, that further research on the prevalence and course of depression symptoms among clients in drug abuse treatment programs is needed to clarify the relationship between treatment and depression.

This report is designed to describe briefly the findings from the Treatment Outcome Prospective Study (TOPS) on the impact of drug abuse treatment on depression. The assessment of depression was based on a three-item measure of depression symptoms designed specially for the study. The report has four purposes:

- determine the validity and utility of a three-item survey measurement of depression symptoms in a drug treatment client population;

- describe the relationship between self-reported depression symptoms and client characteristics and behaviors before treatment;

- investigate the characteristics of clients with different levels of depression symptoms and the services they receive in treatment; and

- ascertain the changes in levels of depression symptoms during and after treatment and the treatment and client characteristics related to these changes.

The overall goal of the report is to provide comprehensive information on depression that can be used to understand better the nature and extent of depression among drug abuse treatment clients and how depression is affected by drug abuse treatment services.

2. METHODOLOGY

The prospective cohort design for the TOPS research has been used in natural life history studies to identify and determine the impacts of key variables (Baltes 1968; Schaie 1977; Labouvie 1978). TOPS has also included a number of nonequivalent control or comparison groups (Campbell and Stanley 1963; Cook and Campbell 1979). The Treatment Outcome Prospective Study (TOPS) is principally a descriptive and correlational study. Although a principal goal of the study is to provide detailed information on the characteristics of clients entering selected drug abuse treatment programs and their behaviors before, during, and after treatment, the design also allows evaluative and causal inferences. The major elements of the sample, data collection, measurement, and analysis approach are described in the following paragraphs. A more complete description of the TOPS research design is available in Hubbard et al. (1984).

STUDY PROGRAMS AND CLIENT POPULATION

Rather than a random sample of programs or clients, cities and programs were purposively selected for TOPS. The 10 cities were selected to reflect drug abuse treatment in large- and medium-sized urban areas with certain types of drug problems and with programs which were believed to have effective approaches to treatment. Forty-one stable, established programs representing major modalities were selected to permit an assessment of treatment process as it might optimally be conducted. An attempt was made to include at least one methadone, residential, and outpatient drug free (OPDF) program in each city. However, in two cities, Chicago and Detroit, large outpatient drug free programs appropriate for the TOPS research design could not be recruited. Large outpatient short-term (28-day) detoxification programs were not in operation in four cities and detoxification programs in four other cities closed during the course of the study. Neither the 10 cities nor the 41 programs represented a national sample in statistical terms. The programs, however, did appear to reflect adequately the range of treatments available in the period 1979-1981.

The full-scale Intreatment Study began in January 1979 and involved the voluntary participation of 3,506 clients at intake to 27 treatment units (3 outpatient detoxification, 8 outpatient methadone--including maintenance to abstinence and long-term maintenance--9 residential drug free, and 7 outpatient drug free) in six cities (Chicago, Des Moines, New Orleans, New York, Phoenix, and Portland, Oregon). Almost 6,000 additional intreatment interviews were conducted with these clients after 1 month, 3 months, and each

subsequent quarter a client remained in treatment. The four Miami and three San Francisco programs were added in January 1980, and three Detroit and four Philadelphia programs were added in January 1981. Intreatment data collection was terminated in December 1981. The cohort and modality/environment for the 11,182 clients participating in TOPS for the 3 years are shown in table 1.

Table 1

Number of Drug Treatment Clients Interviewed at Intake in Each Modality, 1979-1981

Modality	Admission Cohort 1979	1980	1981	Total
	Number of Intake Interviews			
Outpatient Methadone	1,135	1,563	1,486	4,184
Residential	944	929	1,018	2,891
Outpatient Drug Free	906	1,134	874	2,914
Outpatient Detoxification	521	305	367	1,193
Total	3,506	3,931	3,745	11,182

The population from which TOPS samples were selected was composed of all clients who entered TOPS programs in 1979, 1980, and 1981 and completed an intake interview. This population included clients from the Treatment Alternatives to Street Crime (TASC) programs* in Chicago, Des Moines, Phoenix, Portland, and Miami who entered TOPS drug treatment programs.

The design of the followup study called for 1- and 2-year posttreatment followups of 1,310 clients who entered TOPS programs in 1979 and 90-day and 1-year posttreatment followups of 2,300 clients who entered TOPS programs in 1980. Twelve- to 36-month posttreatment followup of 1,000 clients in the 1981 admission cohort started in early 1985. (See table 2.)

DATA COLLECTION PROCEDURES

TOPS was designed to provide data encompassing broad-based social, social-psychological, and socioeconomic perspectives. The general categories of variables covered in the TOPS interviews include background (drug use, employment, criminal behavior); treatment experience (prior treatment, services

*Treatment Alternatives to Street Crime (TASC) programs were federally funded, locally administered programs to identify drug users who came into contact with the criminal justice system, to refer eligible clients to treatment, and to monitor their progress.

Table 2

Followup Sample Design

Modality	Number of Clients Selected in Each Admission Cohort 1979	1980
Outpatient Methadone	323	841
Residential	421	556
Outpatient Drug Free	415	714
Outpatient Detoxification	151	189
Total	1,310	2,300

received); and social factors (family support, involvement in the drug culture). Whenever possible, standard measures of key variables were used, such as Uniform Crime Report categories of crime, and employment status as measured and defined by the Current Population Survey of the Bureau of Labor Statistics.

Full-time, program-based data collectors were employed to interview clients in each participating program. Their work was integrated with the ongoing operation of the program. Eighty-two percent of clients were interviewed at intake. About 5 percent refused to participate. A large proportion of clients who contacted the program only once could not be recontacted for an interview. Ninety percent of the scheduled intreatment interviews were completed.

Professional survey field interviewers have conducted the TOPS followup interviews outside the programs in a variety of settings including homes, fast food restaurants, and jails. Data collection for the 1979 and 1980 followup samples began in May 1980 and was completed in December 1982 with a response rate of about 80 percent. Data collection for the 1981 followup sample is ongoing.

MEASUREMENT OF DEPRESSION SYMPTOMS

A set of three questions was developed for the TOPS interviews as a brief measure of depression that could be included in multipurpose survey studies. These three items are self-reports of (1) feeling so depressed that one could not get out of bed in the morning, (2) having thought of suicide, or (3) having attempted suicide. The data generated by these items were used to determine the prevalence of depression symptoms among TOPS clients at intake and at various times during and after treatment. In addition, patterns of changes in depression symptoms over time were examined.

While these items appear to have face validity, it seemed prudent to validate the TOPS depression symptoms against clinically recognized, validated depression scales. The principal purpose of the validation substudy was to determine the accuracy of the three-item scale. If it was sufficiently accurate, it could be confidently used in analyses of depression in the TOPS database. The Beck Depression Inventory, the CES-D (a depression scale developed by the NIMH Center for Epidemiological Studies) and the Koss and Butcher critical items derived from the Minnesota Multiphasic Personality Inventory were chosen from the wide variety of depression inventories for the TOPS validation substudy because they are well documented, objective, and easy to administer. Described in detail in Allison et al. (1982), the validation substudy is described briefly in the following paragraphs.

In seven drug abuse treatment programs (two residential, two methadone, two outpatient drug free and one detoxification), each of the first 30 clients applying for treatment after June 1, 1981 was administered the TOPS intake interview (including the three-item depression symptoms scale) and one of the comparison depression measures (the Beck, CES-D or Koss and Butcher) according to a preplanned schedule. Cutoff scores of 16 for the Beck, 23 for the CES-D, and 8 for the Koss and Butcher were established. Clients scoring below these cutoffs were classified as not depressed, while those scoring at or above them were classified as depressed. A positive response to any one of the three TOPS items was considered sufficient to classify the respondent as depressed.

A comparison of the client classifications was made (table 3). Overall, the classifications made on the basis of the TOPS scale agreed with those made on the basis of the other scale administered in 71 percent of the cases. Twenty-nine percent were mismatches; 15 percent were "false positives" and 14 percent were "false negatives." "False negative" refers to those clients who were classified as not depressed on the basis of the TOPS scale but were classified as depressed according to the other scale administered. Similarly, "false positive" refers to those classified as depressed on the TOPS scale but not depressed by the comparison scale. Obviously, it cannot be stated that one scale is correct and the other incorrect for any given individual.

The TOPS depression symptoms scale performed well in comparison with the Beck. The correlation between the two was .66, $p < .001$. Classification agreement between the Beck and TOPS scales was 81 percent. The TOPS scale also compared favorably with the CES-D, the correlation being .47, $p < .001$. Classifications made using these two scales matched in 73 percent of the cases. The TOPS scale did not perform similarly to the Koss and Butcher; the correlation between these two was .09, $p > .40$, and classifications of individual clients matched in only 60 percent of the cases.

On the basis of the high levels of agreement with the Beck and CES-D inventories, it seems reasonable to conclude that the three-item TOPS depression indicators scale, although brief, is an adequately reliable and valid instrument for screening drug abuse clients for depression in a large-scale, multipurpose survey study. Therefore, confidence can be placed in the prevalence estimates of depression symptoms as well as other depression-related findings from the overall TOPS database.

Table 3

Comparison of Classifications Made on the Basis of the TOPS Three-Item Depression Indicators Scale and Three Other Depression Scales Administered at Treatment Admission

Comparison	r[a]	Match: Depressed on Both Scales	Match: Not Depressed on Both Scales	Mismatch: False Positives[b]	Mismatch: False Negatives[c]	n
TOPS/Koss and Butcher	.09	46%	14%	19%	22%	81
TOPS/Beck	.66*	34	47	18	1	74
TOPS/CES-D	.47*	39	34	9	19	71
TOPS/Any Comparison	.41*	40	31	15	14	226

[a]Correlations shown are the product moment correlations between the classifications (depressed/not depressed) rather than between the raw test scores.

[b]False positive if TOPS scale classifies as depressed but other scale classifies as not depressed.

[c]False negative if TOPS scale classifies as not depressed but other scale classifies as depressed.

*$p < .001$

ANALYSIS APPROACH

The characteristics and behaviors of clients receiving detoxification services and entering the three main treatment modalities are described in the following sections. The tables present data separately for each of the four modalities. The modality designation was based on the modality to which the client was initially admitted and, in most cases, received treatment.

Most behavioral measures used in this report are based on self-reports of behavior in the year before entering the TOPS program. We felt this 1-year period provided a baseline of sufficient length to characterize adequately the behavior patterns of clients without sacrificing accuracy due to problems of recall.

As will be pointed out, the four modalities serve groups of clients with very different distributions of characteristics and behaviors. Programs may

simply admit smaller or larger numbers of particular types of clients because of their location (i.e., suburban OPDF programs with a large number of young, white clients) or eligibility requirements (i.e., methadone programs, usually located in urban areas, admit only heroin addicts). A null hypothesis is that a particular type of client (i.e., a 35-year-old black male heroin addict or a 20-year-old white female nonnarcotic drug abuser) has the same characteristics and problems and behaves in the same way before treatment regardless of the modality of treatment. In order to determine whether clients entering each modality, indeed, have different patterns of characteristics or different types and severities of problems, multivariate analyses were conducted. Because many of the important variables of interest are categorical or have nonnormal distribution, a log-linear regression procedure was used (Grizzle et al. 1969). The results of these analyses are calculated as adjusted odds-ratios. The odds ratios can be interpreted as comparative risk factors (for particular problems) after other factors are controlled statistically. In the particular log-linear regression approach used in this report (Harrell 1980), the odds ratio is calculated for each characteristic in comparison to a selected reference group (i.e., marijuana users and multiple nonnarcotic users are compared to heroin users). For example, a client with a pattern of multiple nonnarcotics use might have a comparatively higher risk of depression symptoms (i.e., the odds-ratio is greater than 1.00) than a similar client who used mainly heroin in the year before treatment. An older black male heroin addict may have a comparatively lower risk of depression symptoms (i.e., the odds-ratio is less than 1.00) than a young white female heroin addict. Regression models were constructed to predict depression symptoms before, during, and after treatment.

In the models predicting depression symptoms during and after treatment, the level of depression symptoms in the year before treatment was included as a predictor. These regression models are designed to assess the relationship of particular sets of major variables when other factors are adjusted.

3. PREVALENCE AND CORRELATES OF DEPRESSION SYMPTOMS

In this chapter, the nature and extent of depression symptoms and their relationships to a broad range of sociodemographic and treatment variables are examined for the three TOPS cohorts. A few of the relationships--principally those of greater general interest--are presented in tables. Because the cohorts did not differ appreciably on most of these variables, combined data for all three cohorts are presented. Where differences across cohorts are noteworthy, they are discussed in the text.

A logistic regression procedure was used to identify the relative risk factors for suicidal thoughts and suicide attempts in the year before treatment after adjustment for other factors. The variables included in the regression model are age, race, sex, prior treatment, pattern of drug use, source of referral, and treatment modality. The analytical results profile the individuals entering treatment who have the greatest risk of serious depression symptoms.

NATURE AND EXTENT OF DEPRESSION SYMPTOMS

The TOPS data clearly show that feelings of depression, suicidal thoughts and suicide attempts were common among clients entering each of the four treatment modalities in each study year. The rates of depression symptoms and suicide attempts were very high compared to the general population.

It was assumed that being unable to get out of bed is less severe than thinking about suicide which is, in turn, less severe than having attempted suicide. On this basis, the items were ranked and the respondent's "most severe" response was used in the calculation of the percentages. The distributions of depression symptoms for clients who completed an intake interview at a TOPS program in 1979, 1980, or 1981 are shown in table 4.

Three of every five clients coming into TOPS drug abuse treatment programs stated that they experienced one or more of these depression symptoms in the year before admission (table 4). More clients entering outpatient drug free (OPDF) or residential treatment programs reported experiencing depression symptoms during the year before admission, and substantially greater percentages of these clients reported having attempted suicide than clients entering detoxification or outpatient methadone programs.

Table 4

Depression Symptoms by Cohort for Each Modality/Environment

Cohort	n	Depression Symptoms: None	Felt Depressed	Suicidal Thoughts	Suicide Attempts
		Outpatient Detoxification			
1979	520	42.5%	22.3%	29.4%	5.8%
1980	305	44.9	23.9	24.6	6.6
1981	366	52.2	21.3	23.0	3.6
Total	1191	46.2%	22.4%	26.1%	5.3%
		Outpatient Methadone			
1979	1102	42.8%	27.4%	24.2%	5.6%
1980	1524	43.6	24.4	25.9	6.2
1981	1465	51.5	23.3	19.5	5.7
Total	4091	46.3%	24.8%	23.1%	5.8%
		Residential			
1979	865	38.0%	16.8%	30.3%	14.9%
1980	915	37.9	20.0	30.3	11.8
1981	1008	34.5	21.9	29.0	14.6
Total	2788	36.7%	19.5%	30.0%	13.8%
		Outpatient Drug Free			
1979	887	36.8%	15.7%	33.6%	14.0%
1980	1121	39.3	12.9	33.9	13.8
1981	859	38.6	13.7	35.0	12.6
Total	2867	38.5%	13.9%	34.1%	13.5%

Note: Clients were classified according to the most severe symptom reported in the year before they entered treatment.

An important clinical question is whether a depressed client is more likely to select or be referred to a particular modality. The logistic regression results confirm that after adjusting for other risk factors, clients who entered OPDF were 2.3 times ($p < .0001$) more likely to report suicidal thoughts or attempts in the year before treatment than clients who entered outpatient methadone programs. Residential clients were 2.5 times ($p < .0001$) more likely to report suicidal thoughts or attempts than methadone clients.

Both the prevalence of the more severe depression symptoms and the relative risk of symptoms were significantly higher for clients entering residential and OPDF programs. Residential and OPDF clients, even after statistically adjusting for characteristics and drug use patterns, were more likely to report depression symptoms. The residential and OPDF clients would appear to have a greater need of mental health services than methadone clients.

The age of clients is another possible explanation. Twenty-seven percent of the OPDF clients and 19 percent of residential clients were under 21. Though the rate of suicide attempts reported by methadone clients is one-third that reported by OPDF and residential clients, similar proportions of clients in all three modalities reported suicidal thoughts. Methadone clients, only 2 percent of whom were under 21, may be less impulsive. Too, far higher proportions of methadone clients currently use heroin and other narcotics. These may be used to alleviate depression and prevent self-destructive behavior.

DEMOGRAPHIC CHARACTERISTICS

Previous research identified a number of depression-linked characteristics in the general population and among clients in the individual drug abuse treatment programs. The key clinical question is whether these characteristics are related to depression symptoms in a national sample of drug abuse treatment clients and whether the relationships hold for clients in each of the major treatment modalities.

Females in each sex/age group were more likely than males in the same group to report any depression symptom--the differences ranged from 10 percent to 27 percent. The contrast was greatest for outpatient drug free. The sex/age group contrast for suicidal thoughts and attempts also showed higher rates for females. In the suicide attempts column in table 5, for example, females showed higher rates than males in 14 of the 15 sex/age comparison groups. In these comparison groups, females were 1.5 to 5 times more likely to have attempted suicide than males.

The effects of age were not as clear as those of sex. Those over 30 appeared to be less depressed, though the two lowest rates of any depression symptoms were found among males under 21 in outpatient methadone and outpatient drug free. Suicidal thoughts did not appear to be age related, though suicide attempts were more common among those 25 and under. Females under 21 had by far the highest rates for suicide attempts in three of the four modalities.

The results of the multivariate analyses confirm only some of the conclusions from the tabular findings. Females entering methadone, outpatient drug free, or residential drug treatment modalities were 1.76 times ($p < .0001$) more

Table 5

Depression Symptoms During the Year Before Treatment by Sex and Age

Sex/Age at Intake	n	Depression Symptoms: None	Felt Depressed	Suicidal Thoughts	Suicidal Attempts
		Outpatient Detoxification			
Male					
< 26	153	43.8%	17.7%	32.0%	6.5%
26-30	317	48.6	24.0	24.9	2.5
> 30	426	52.8	22.5	21.8	2.8
Female					
< 26	90	27.8%	21.1%	33.3%	17.8%
26-30	105	34.3	29.5	23.8	12.4
> 30	93	43.0	18.3	34.4	4.3
		Outpatient Methadone			
Male					
< 21	44	52.3%	22.7%	15.9%	9.1%
21-25	448	46.9	27.2	20.5	5.4
26-30	1024	47.9	25.7	22.4	4.1
> 30	1310	54.7	22.3	19.2	3.8
Female					
< 21	41	29.3%	36.6%	26.8%	7.3%
21-25	364	35.4	26.7	28.9	9.1
26-30	536	34.1	21.8	33.4	10.6
> 30	368	40.5	29.6	22.3	7.6
		Residential			
Male					
< 21	393	36.4%	15.5%	28.8%	19.3%
21-25	604	37.1	20.7	29.6	12.6
26-30	609	39.7	18.2	33.0	9.0
> 30	624	45.7	21.0	26.9	6.4
Female					
< 21	157	21.7%	16.6%	26.8%	35.0%
21-25	226	25.7	19.5	31.9	23.0
26-30	158	27.9	20.3	32.3	19.6
> 30	100	25.0	29.0	34.0	12.0
		Outpatient Drug Free			
Male					
< 21	518	52.7%	11.2%	27.6%	8.5%
21-25	534	43.3	14.4	31.5	10.9
26-30	454	41.0	15.2	35.0	8.8
> 30	417	41.7	12.7	35.3	10.3
Female					
< 21	267	26.2%	8.6%	38.6%	26.6%
21-25	296	24.0	17.9	37.2	21.0
26-30	202	25.3	18.8	37.1	18.8
> 30	189	27.0	15.9	40.7	16.4

Note: Rows add to 100%

likely than men to report suicidal thoughts or attempts in the year before treatment. Approximately the same relative risk for females was found in each of these three modalities. The hypothesis that females under 21 have the highest risk for suicidal thoughts and attempts was not confirmed. Young females were about 1.23 times more likely to report suicidal thoughts and attempts than women 21-25 ($p < .10$) and 1.35 times more likely than females over 30 ($p < .03$). There was virtually no difference in the relative risk for reporting suicidal thoughts or attempts among the age groups for the male clients. The higher prevalence rates of suicidal thoughts and attempts among females under 21 may be attributable to other factors such as their drug use patterns or referral sources.

In all modalities, black clients entering treatment were less likely to report depression symptoms than white or Hispanic clients. From 61 to 69 percent of whites and 55 to 75 percent of Hispanics said they had had one or more depression symptoms during the year before treatment. In contrast, 42 to 55 percent of black clients in all modalities made that statement (table 6). The multivariate results confirmed the findings that white and Hispanic clients were two to three times more likely to report suicidal thoughts or attempts than black clients ($p < .0001$), regardless of treatment modality.

TREATMENT HISTORY AND SOURCE OF REFERRAL

More prior drug abuse treatment experience and the source of referral for the current treatment episode may indicate a higher risk for depression.

In detoxification programs, clients who had no history of previous treatment for drug abuse reported higher rates of depression during the year before treatment. Also, detoxification and outpatient methadone clients who had three or more prior drug abuse treatment episodes were more likely to report having thought of suicide than clients with fewer or no past treatment episodes. In the other two modalities, there appeared to be no relationship between depression symptoms and prior drug abuse treatment admissions. After adjusting for other factors, outpatient methadone clients who had three or more treatment episodes were 1.84 times more likely to report suicidal thoughts or attempts than methadone clients with no prior episodes ($p<.0001$).

The vast majority of clients in detoxification and outpatient methadone programs were referred by themselves or by their family or friends. There appears to be no difference in the reports of depression symptoms between the self-referred and family/friend-referred groups. In residential programs, the criminal justice system accounted for more referrals than any of the other three sources. A substantial proportion was referred through some "other" referral source, usually a community agency such as a mental health center, social service agency, central intake unit, or another drug program. Those "other"-referred clients were more likely to have experienced some sign of depression during the year before treatment. There seems to be no other relationship between depression symptoms and referral source among residential clients. In OPDF programs, clients were about evenly split among the four referral sources (self, family or friends, criminal justice system, and other--usually a central intake unit or another drug program). Criminal justice system referrals reported fewer depression symptoms (including suicide attempts) than those referred by other sources.

Table 6

Depression Symptoms During the Year Before Treatment by Race or Ethnic Background

Race/Ethnic Background	n	Depression Symptoms: None	Felt Depressed	Suicidal Thoughts	Suicidal Attempts
			Outpatient Detoxification		
White	282	30.8%	16.7%	39.4%	13.1%
Black	833	53.2	24.1	20.1	2.6
Hispanic	65	24.5	24.6	44.6	6.2
			Outpatient Methadone		
White	1,692	39.7%	25.2%	27.8%	7.3%
Black	1,522	58.4	25.8	13.5	2.4
Hispanic	885	38.2	22.7	30.3	8.8
			Residential		
White	1,521	30.8%	15.8%	35.0%	18.4%
Black	1,134	45.1	24.4	22.6	7.9
Hispanic	193	33.7	20.7	34.7	10.9
			Outpatient Drug Free		
White	2,308	36.6%	13.4%	35.7%	14.3%
Black	296	48.0	17.9	24.0	10.1
Hispanic	240	45.4	14.2	31.3	9.2

Note: Rows add to 100%.

The multivariate results indicated very different patterns of relationships between source of referral and depression symptoms in each modality. In residential programs, clients referred from community agencies were 1.96 times more likely than legally referred clients to report suicidal thoughts or attempts ($p < .0001$). Clients referred by family and friends and self-referrals also were much less likely to report suicidal thoughts or attempts than community agency referrals. A different pattern was found for OPDF clients. Community agency referrals were about as likely to report suicidal throughts or attempts as self-referrals and family and friend referrals. Community agency referrals, however, were 2.71 times as likely to report

suicidal thoughts or attempts as clients referred by the criminal justice system ($p < .0001$). In methadone programs, community agency referrals were 1.25 times more likely to report suicidal thoughts or attempts than self-referrals ($p < .05$) and 2.91 times more likely than criminal justice referrals ($p < .0001$).

Based on the multivariate analysis results, it seems clear that prior treatment and source of referral are important predictors of suicidal thoughts and attempts. The relationships, however, are specific to each modality. Even after adjusting for other characteristics in the analyses, each modality appears to attract and serve different types of clients.

ALCOHOL AND DRUG USE

It is possible that depressed clients self-medicate. It is equally possible that particular patterns of drug use contribute to depression symptoms. Regardless of the causal relationship, drug use patterns, particularly the use of multiple nonnarcotics, appear to be strongly related to depression symptoms.

Bray et al. (1982) identified seven patterns of drug use. In this scheme, "other narcotics" were the opioid drugs such as codeine, Darvon, Demerol, and Talwin. Nonnarcotics were such drugs as barbiturates, sedatives and hypnotics, cocaine, amphetamines, and tranquilizers. TOPS clients' drug use was classified in a hierarchical pattern based on their reports of drug use in the year before treatment. These patterns are: (1) heroin, other-narcotics, (2) heroin, no other narcotics, (3) other narcotics, but not heroin, (4) multiple nonnarcotics, (5) single nonnarcotic, (6) alcohol and/or marijuana, and (7) minimal use. (See the appendix for a fuller explanation of the drug use pattern used in TOPS.)

Table 7 shows the distribution of the various drug use pattern groups across depression symptoms. In detoxification, methadone, and residential programs, clients in the minimal use, alcohol/ marijuana and heroin only groups were least likely to report depression symptoms during the year before treatment. OPDF clients in the alcohol/marijuana and minimal use groups were also least likely to report symptoms. In all modalities, clients in the multiple nonnarcotics group were most likely to say they had attempted suicide.

These observations were confirmed in the multivariate analyses. In methadone, residential, and outpatient drug free, multiple nonnarcotics users had the highest risk of suicidal thoughts or attempts. Table 8 shows the relative risk factors for each of six drug use patterns compared to the use of heroin alone. It is clear from this table that heroin users who also used other narcotics in residential and outpatient drug free programs reported more suicidal thoughts and attempts. This was not true for methadone clients. In all modalities, those who were multiple nonnarcotics users had a significantly higher risk of suicidal symptoms than heroin users ($p < .0001$). The minimal users had the lowest risk in all modalities. These results suggest that the more depressed clients were using a variety of drugs, perhaps indiscriminately, without knowing or being concerned about their potential lethality. This may indicate either self-destructive behavior or a

Table 7

Depression Symptoms During the Year Before Treatment by Drug Use Pattern

Drug Use Pattern	n	Depression Symptoms: None	Felt Depressed	Suicidal Thoughts	Suicidal Attempts
			Outpatient Detoxification		
Heroin-Other-Narcotics	116	41.4%	23.3%	29.3%	6.0%
Heroin	857	49.0	23.5	24.6	2.9
Other Narcotics	98	30.9	26.5	29.4	13.2
Multiple Nonnarcotics	19	21.1	5.3	42.1	31.6
Single Nonnarcotic	53	34.0	13.2	30.2	22.6
Alcohol/Marijuana	57	47.4	17.5	29.8	5.3
Minimal Use	16	62.5	12.5	18.8	6.3
			Outpatient Methadone		
Heroin-Other-Narcotics	789	39.7%	29.3%	24.1%	7.0%
Heroin	2,179	47.4	24.6	22.8	5.3
Other Narcotics	370	37.3	29.2	26.5	7.0
Multiple Nonnarcotics	52	32.7	25.0	28.9	13.5
Single Nonnarcotic	169	47.9	18.3	23.7	10.1
Alcohol/Marijuana	371	55.0	19.1	22.4	3.5
Minimal Use	210	62.4	17.6	16.7	3.3
			Residential		
Heroin-Other-Narcotics	364	34.9%	21.7%	27.8%	15.7%
Heroin	576	41.2	22.7	28.5	7.6
Other Narcotics	481	32.6	20.0	32.0	15.4
Multiple Nonnarcotics	362	24.6	12.2	35.6	27.6
Single Nonnarcotic	465	35.1	19.1	31.8	14.0
Alcohol/Marijuana	434	42.4	18.9	28.3	10.4
Minimal Use	193	51.3	20.7	21.8	6.2
			Outpatient Drug Free		
Heroin-Other-Narcotics	101	20.8%	16.8%	40.6%	21.8%
Heroin	202	31.8	20.5	36.4	11.4
Other Narcotics	328	26.5	15.6	40.6	17.4
Multiple Nonnarcotics	314	18.5	13.7	38.5	29.3
Single Nonnarcotics	636	33.7	14.3	37.1	14.9
Alcohol/Marijuana	1,033	49.7	12.5	30.5	7.4
Minimal Use	257	58.1	10.1	23.0	9.0

Note: Rows add to 100%. Drug use patterns are defined in the appendix.

Table 8

Comparative Risk Factors of Drug Use Patterns for Suicidal Thoughts and Attempts During the Year Before Treatment

Drug Use Pattern	Outpatient Methadone	Residential	Outpatient Drug Free
Heroin[a]	(1.00)	(1.00)	(1.00)
Heroin-Other-Narcotics	1.00	1.50	1.38
Other Narcotics	1.17	1.15	1.39
Multiple Nonnarcotics	1.74**	1.74**	2.91**
Single Nonnarcotic	.99	1.09	1.36
Alcohol/Marijuana	.77	1.03	.75
Minimal Use	.38**	.53*	.47**

[a]Comparison group.
*p<.01
**p<.001

frantic attempt to self-medicate otherwise uncontrollable psychological problems. Clearly, the use of multiple drugs is closely linked to depression symptoms, regardless of the reason.

Alcohol use has been linked to depression symptoms (Midanik 1981). Among drug treatment clients, this relationship is noticeable. Heavy drinkers and, to a lesser extent, light or infrequent drinkers (as determined by self-reports of the quantity and frequency of alcohol use) in residential and OPDF treatment programs were more likely to report depression symptoms, especially suicide attempts, than abstainers or moderate drinkers. (See Schlenger et al. 1984 for description of the alcohol measures used in TOPS.) This non-linear pattern of results is somewhat puzzling and will need to be examined further. In the other two modalities, alcohol use and depression indicators appeared to be unrelated.

CRIME, EMPLOYMENT AND DRUG CULTURE

The relatively infrequent reports of depression symptoms among clients referred by the criminal justice system suggest that criminally active clients are not as likely as others to be depressed. A complex pattern of relationships between depression symptoms and criminal involvement was found, however. Among clients in detoxification and methadone programs, there appeared to be no clear or strong relationship between the number of predatory illegal acts* committed and depression symptoms with two exceptions: (1) There was a

*Predatory illegal acts are aggravated assault, robbery, burglary, larceny, auto theft, forgery-embezzlement, and dealing in stolen property.

tendency for detoxification clients in the 1979 and 1981 cohorts who had committed such acts to report that they had suicidal thoughts during the year before treatment; and (2) 1981 methadone clients who reported no such acts were somewhat more likely to report no depression symptoms. In residential and OPDF programs, however, there was a clear relationship. Clients who committed more predatory illegal acts were more likely to report depression symptoms. That those who committed more predatory illegal acts were more likely to manifest depression symptoms seems inconsistent with other findings. More detailed analyses that distinguish between committing a crime and being apprehended for it would be necessary to clarify the relationships.

Full-time productive employment may mitigate depression symptoms. Results supporting this hypothesis, however, were found only among OPDF clients. Clients in OPDF treatment programs who were fully employed 40 to 52 weeks during the year before treatment were less likely to have attempted suicide or to report any depression symptom during that year. Among OPDF clients employed less than 40 weeks and among all clients in other modalities, there was no discernible relationship between depression symptoms and employment.

Another factor possibly contributing factor to depression symptoms is the involvement of an individual in the drug culture. Involvement with drug sales and peers who used drugs extensively was indicated by a measure of drug use network involvement. Clients who said they were highly involved in the drug use network were more likely to say they experienced some depression symptom during the year before they entered drug abuse treatment. In particular, they were more likely to report having attempting suicide. These relationships were especially strong in the residential and OPDF modalities.

SUMMARY

The previous discussion outlined a number of factors that appear to be related to depression symptoms. Clearly, residential and outpatient drug free clients had higher overall rates of reported depression symptoms. After controlling for other factors, they were still more likely to report depression symptoms than were methadone clients. Table 9 briefly summarizes the risk factors related to reports of suicidal thoughts and attempts after adjusting for a variety of factors in a logistic regression model. Some characteristics such as sex and race and multiple nonnarcotic drug use were major risk factors regardless of the modality. In methadone programs, referral from a source other than the criminal justice system and three or more prior treatment episodes were key risk factors. In residential programs, use of heroin and other narcotics and referral from a community agency increased the risks of suicidal symptoms. In outpatient drug free programs, self-referral or referral from a source other than the criminal justice system increased the risks of reporting suicidal symptoms.

The results of these analyses confirm the findings of other studies in different populations. Males and blacks were less likely to report depression symptoms. The results for drug use patterns, referral source, and prior treatment were more specific to modality. Knowledge of these risk factors should help clinicians identify clients entering drug abuse treatment programs who are more likely to be depressed.

Table 9

Comparative Risk Factors for Suicidal Thoughts and Attempts During the Year Before Treatment

Risk Factors	Outpatient Methadone	Residential	Outpatient Drug Free
White vs. black	2.89***	2.98***	2.18***
Female vs. male	2.13***	1.69***	1.71**
Multiple nonnarcotic vs. heroin	1.74***	1.74***	2.91***
Heroin and other narcotics vs. heroin	1.00	1.50*	1.38
Minimum use vs. heroin	.38***	.53*	.47*
Legal vs. self-referral	.43**	.92	.37**
Community agency vs. self-referral	1.25*	1.96***	.89
Three or more prior treatment vs. no prior treatments	1.84***	1.05	1.09

*p<.05
**p<.01
***p<.001

4. CHARACTERISTICS AND TREATMENT OF "NONDEPRESSED," "DEPRESSED," AND "SUICIDAL" GROUPS

The previous chapter described the client characteristics that were related to depression symptoms. In addition to describing the prevalence of depression symptoms among various types of clients, it is of clinical interest to examine the common characteristics of three client groups: those who report (1) no signs of depression (nondepressed), (2) feeling so depressed they could not get out of bed (depressed), or (3) having thought about or attempted suicide (suicidal) at some time during the year before admission. An analysis presented in the first section of this chapter provides data to build a profile of clients with different levels of depression symptoms; however, other factors may affect depression among drug treatment clients. The nature and extent of drug-related problems among the groups of depressed clients are discussed in the second section of this chapter. The different services provided to clients with each level of depression symptoms are discussed in the third section.

To treat clients effectively, they must be retained in treatment. (For this reason, the short-term detoxification clients are excluded from this chapter.) Table 10 shows the proportions of clients remaining in treatment for at least 3 months for the three modalities. As the table shows, outpatient methadone programs appeared to have somewhat more success in retaining depressed and suicidal clients in treatment than nondepressed clients. Retention of suicidal clients in outpatient drug free and residential programs appeared to be somewhat lower than in methadone.

Although those clients who reported suicide attempts are of special clinical interest, in this chapter they are grouped with clients who reported suicidal thoughts. The two groups are combined because their demographic characteristics and retention rates are similar and because the number of clients reporting suicide attempts, particularly during treatment, was very small, precluding the use of suicide attempts alone as either a descriptor or an outcome measure. Therefore, we feel, for both the clinical and analytic purposes of this report, the combination of the two suicidal symptoms is appropriate and useful.

Table 10

3-Month Retention Rates of Clients
in Pretreatment Depression Symptoms Categories

Modality	Proportions in Each Pretreatment Depression Symptom Category Who Stayed in Treatment 3 Months or More			
	Non-depressed	Depressed	Suicidal	(Attempts Only)
Outpatient Methadone	51.9%	56.9%	58.4%	(54.0%)
Residential	38.9	35.5	36.5	(33.3)
Outpatient Drug Free	27.2	30.3	23.9	(24.0)

Note. "Attempts only" is a subcategory of "suicidal."

CLIENT CHARACTERISTICS

Tables 11 through 14 present data on selected characteristics of nondepressed, depressed, and suicidal clients. Generally, these results are consistent with those reported in the previous chapter. The depressed and suicidal groups had larger than expected proportions of females, whites, and multiple drug users. Even though these factors increased the risk of depression symptoms, the depressed and suicidal groups also included substantial numbers of males, blacks, and heroin users. Thus, depression could complicate the diagnosis and treatment of any particular demographic group. While clients entering detoxification programs stay 28 days or less and are not likely to be treated for depression, their profiles may be of interest for comparisons and to suggest the need for appropriate referral.

DEMOGRAPHIC CHARACTERISTICS

In each modality, the suicidal group had a larger proportion of females than the depressed or nondepressed group. This difference was especially striking in the outpatient methadone modality, where 31.7 percent of all clients were women, yet 41.6 percent of the suicidal group were females--a difference of 10 percent. In general, it also appears that depressed and suicidal clients were somewhat younger than the nondepressed group; however, the magnitude of the difference varies across modalities and across cohorts.

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Table 11

Characteristics of Detoxification Clients in Three Depression Symptom Categories

	Depression Symptom Category		
	Nondepressed (n=549)	Depressed (n=267)	Suicidal (n=375)
Sex			
Male	81.6%	74.8%	67.7%
Female	18.4	25.2	32.3
Total	100.0%	100.0%	100.0%
Age at Intake			
< 21	0.2%	3.0%	4.0%
21-30	51.4	54.5	58.0
> 30	48.4	42.5	38.0
Total	100.0%	100.0%	100.0%
Race			
White	15.9%	17.7%	39.8%
Black	80.8	75.6	50.8
Hispanic	2.9	6.0	8.9
Other	0.5	0.4	0.8
Total	100.0%	100.0%	100.0%
Drug Use Pattern			
Heroin-Other-Narcotics	8.8%	10.2%	11.0%
Heroin	76.6	75.6	63.4
Other Narcotics	3.8	6.8	7.8
Multiple Nonnarcotics	0.7	0.4	3.8
Single Nonnarcotics	3.3	2.6	7.5
Alcohol/Marijuana	4.9	3.8	5.4
Minimal Use	1.8	0.8	1.1
Total	100.0%	100.0%	100.0%

Note: Depression symptom category is based on reports of depression during the year before treatment.

Table 12

Characteristics of Outpatient Methadone Clients
in Three Depression Symptom Categories

	Depression Symptom Category		
	Nondepressed (n=1890)	Depressed (n=1016)	Suicidal (n=1185)
Sex			
Male	75.2%	67.1%	58.4%
Female	24.8	32.9	41.6
Total	100.0%	100.0%	100.0%
Age at Intake			
< 21	1.8%	2.4%	2.1%
21-30	52.9	58.4	63.6
> 30	45.3	39.1	34.3
Total	100.0%	100.0%	100.0%
Race			
White	35.0%	41.6%	49.6%
Black	46.4	38.2	20.1
Hispanic	17.6	19.6	28.9
Other	1.0	0.7	1.3
Total	100.0%	100.0%	100.0%
Drug Use Pattern			
Heroin-Other-Narcotics	16.3%	22.5%	20.5%
Heroin	53.9	52.1	51.1
Other Narcotics	7.2	10.5	10.4
Multiple Nonnarcotics	0.9	1.3	1.8
Single Nonnarcotics	4.2	3.0	4.8
Alcohol/Marijuana	10.7	6.9	8.0
Minimal Use	6.8	3.6	3.5
Total	100.0%	100.0%	100.0%

Note: Depression symptom category is based on reports of depression during the year before treatment.

Table 13

Characteristics of Residential Clients in Three Depression Symptom Categories

	Depression Symptom Category		
	Nondepressed (n=1024)	Depressed (n=549)	Suicidal (n=1215)
Sex			
Male	84.8%	76.5%	72.3%
Female	15.2	23.5	27.7
Total	100.0%	100.0%	100.0%
Age at Intake			
< 21	16.8%	15.6%	22.8%
21-30	53.8	55.8	57.0
> 30	29.4	28.6	20.2
Total	100.0%	100.0%	100.0%
Race			
White	44.3%	42.8%	64.6%
Black	48.5	49.4	27.4
Hispanic	6.2	7.1	7.0
Other	1.0	0.7	1.0
Total	100.0%	100.0%	100.0%
Drug Use Pattern			
Heroin-Other-Narcotics	12.0%	14.1%	12.6%
Heroin	22.4	23.4	16.5
Other Narcotics	14.9	17.1	18.1
Multiple Nonnarcotics	8.4	7.8	18.2
Single Nonnarcotics	15.4	15.9	16.9
Alcohol/Marijuana	17.4	14.6	13.4
Minimal Use	9.4	7.1	4.3
Total	100.0%	100.0%	100.0%

Note: Depression symptom category is based on reports of depression during the year before treatment.

Table 14

Characteristics of Outpatient Drug Free Clients in Three Depression Symptom Categories

	Depression Symptom Category		
	Nondepressed (n=1099)	Depressed (n=402)	Suicidal (n=1366)
Sex			
Male	78.1%	64.2%	58.5%
Female	21.9	35.8	41.5
Total	100.0%	100.0%	100.0%
Age at Intake			
< 21	31.0%	20.2%	26.4%
21-30	48.7	59.1	51.9
> 30	20.3	20.7	21.8
Total	100.0%	100.0%	100.0%
Race			
White	76.0%	76.9%	83.9%
Black	12.8	13.2	7.4
Hispanic	9.8	8.5	7.0
Other	1.4	1.5	1.7
Total	100.0%	100.0%	100.0%
Drug Use Pattern			
Heroin-Other-Narcotics	1.9%	4.2%	4.6%
Heroin	6.3	11.2	7.6
Other Narcotics	7.8	12.7	13.8
Multiple Nonnarcotics	5.2	10.7	15.5
Single Nonnarcotics	19.2	22.6	24.1
Alcohol/Marijuana	46.1	32.1	28.4
Minimal Use	13.4	6.5	6.0
Total	100.0%	100.0%	100.0%

Note: Depression symptom category is based on reports of depression during the year before treatment.

The three depression symptom groups differed substantially in their racial composition. In general, the suicidal group in each modality had a lower percentage of blacks and a higher percentage of whites than the total client population. For example, about 70 percent of the detoxification clients were black, yet the suicidal group averaged about 50 percent black members. In outpatient methadone programs, 37 percent of the clients were black, while only 20 percent of the suicidal group was black. Similar results were observed in residential programs. Because only about 10 percent of OPDF clients were black, the observed differences were small. Nevertheless, the direction of the differences was the same as that found in the other modalities.

DRUG USE PATTERNS

The relationship between depression symptom group membership and drug use pattern is complex. In detoxification programs 72 percent of the clients were in the heroin only pattern; between 1 and 9 percent of the remaining clients were in each of the other six drug use patterns. The suicidal group had fewer heroin only users than the average for all clients. The percentage of clients using other narcotics, with or without heroin, was slightly less in the nondepressed group.

In methadone programs, the depression symptom categories were not substantially different in the proportions of heroin only users or heroin-other-narcotics users. Further, they did not differ appreciably in the percentages of other narcotics (not heroin) users. Again, the small percentage of clients in the other narcotics (not heroin) group makes interpretation inadvisable. Similarly, the percentages of clients in the remaining drug use patterns were too small to permit meaningful interpretation.

In residential programs, clients were more evenly distributed across the seven drug use patterns. Only the minimal use category had fewer than 10 percent of the clients and may, therefore, be uninterpretable. The suicidal group had a smaller than average percentage of heroin only users, and the nondepressed group had a larger percentage of heroin only users. This same result was found among detoxification clients; however, the magnitude of the differences is considerably smaller in the residential programs. The depression symptom categories were not different with respect to the percentages of heroin-other-narcotics users. The suicidal group had a larger percentage of multiple nonnarcotics users.

OPDF programs had relatively few clients in the three narcotics use categories but they did have substantial percentages of clients in the remaining categories, especially the alcohol/marijuana and single nonnarcotic patterns. The depressed and suicidal groups had smaller percentages of alcohol/marijuana only users in all three cohorts. The depressed and suicidal groups had larger than average percentages of multiple nonnarcotics users. The differences, however, were small. The symptom groups were not substantially different with respect to the percentages of single nonnarcotics users in each.

If any general statement can be made about these results, it is that depressed and/or suicidal clients were less likely to be heroin only or alcohol/marijuana users and more likely to be using other narcotics (with or without heroin) or multiple nonnarcotics.

Not surprisingly, clients in the three depression symptom categories differed in their mental health treatment histories. The suicidal and, to a lesser degree, the depressed groups in all modalities and cohorts had larger percentages of clients who had been treated for mental health problems. From 34 to 59 percent of those who attempted suicide had received mental health treatment. In contrast, only 6 to 22 percent of those without depression symptoms had had such treatment.

There were differences among depression symptom categories in some cohorts and in some modalities in the percentages of clients who had previous treatment for drug abuse. However, no clear pattern was apparent. Likewise, the depression symptom groups did not appear to differ systematically by source of referral.

The number of weeks the clients worked full time during the year before treatment apparently was unrelated to depression symptoms. The groups did differ with respect to drinking type. The suicidal groups had fewer abstainers and more heavy drinkers than the average for all clients within each modality and each cohort. The size of the effect varied slightly across modalities and across cohorts.

DRUG-RELATED PROBLEMS

Depression may be a result, cause, or component of a constellation of other types of problems, such as problems with family or work. Drug use could also contribute substantially to the nature and extent of other problems.

In the TOPS interviews, clients were asked whether their drug abuse had caused them medical, psychological, family/friend, legal, school/employment, or financial problems. Table 15 shows that, in most cases, clients who reported some depression symptom were more likely to report having at least one type of drug-related problem. In general, the more severe the depression symptom, the more likely the person was to say he/she had more types of drug-related problems. The strength of the relationship between depression symptoms and drug-related problems varied across problem types, modalities, and cohorts. Also the percentages of clients who said they had a particular type of drug-related problem varied (see table 16). The most frequently mentioned problems were psychological and family problems. Legal problems (not shown) were of concern to about 15 to 25 percent of detoxification and methadone clients and about 30 to 50 percent of residential and OPDF clients but appeared unrelated to depression symptoms.

The more severe the depression symptoms, the higher the rate of problems. In methadone programs, problems with family and friends were reported by 36.2 percent of nondepressed clients, 49.3 percent of clients reporting an inability to get out of bed, and 63.4 percent of clients with suicidal thoughts and attempts. Similar increments in family/friend problems were found in each depression symptom group for residential (54.0%, 67.6%, and 77.8%) and OPDF (40.3%, 60.0%, and 67.2%) client populations. The rates for specific problems were typically somewhat higher among those who reported attempting suicide than among those who thought about suicide. The patterns, however, were not consistent across the modalities.

Table 15

Number of Drug-Related Problem Areas During the Year Before Treatment for Clients in Three Depression Symptom Categories

Number of Drug-Related Problem Areas	Depression Symptom Category		
	Nondepressed	Depressed	Suicidal
	Outpatient Methadone		
None	30.9%	14.8%	11.1%
1 or 2	42.6	39.9	28.9
3 or 4	21.6	32.8	40.8
5 or 6	5.0	12.5	19.2
Total	100.0% (n=1890)	100.0% (n=1016)	100.0% (n=1185)
	Residential		
None	24.0%	15.3%	11.7%
1 or 2	25.6	21.9	13.7
3 or 4	31.4	31.2	33.3
5 to 6	19.0	31.6	41.3
Total	100.0% (n=624)	100.0% (n=549)	100.0% (n=1215)
	Outpatient Drug Free		
None	27.8%	17.9%	12.5%
1 or 2	40.8	26.9	23.9
3 or 4	24.4	32.6	37.5
5 or 6	6.9	22.6	26.1
Total	100.0% (n=1099)	100.0% (n=402)	100.0% (n=1366)

Note: The six problem areas were: medical or physical; mental health or emotional; family or friends; police or legal; job, work, or school; and financial or money.

Table 16

Types of Drug-Related Problems During the Year Before Treatment for Clients in Three Depression Symptom Categories

Type of Drug-Related Problem	Depression Symptom Category		
	Nondepressed	Depressed	Suicidal
	Outpatient Methadone		
Medical	27.5%	38.5%	41.9%
Psychological	18.4	37.9	54.6
Family/Friends	36.2	49.3	63.4
Job/School	16.7	28.1	35.8
	MR (n=1890)	MR (n=1016)	MR (n=1185)
	Residential		
Medical	32.7%	41.6%	50.8%
Psychological	33.2	51.4	68.0
Family/Friends	54.0	67.6	77.8
Job/School	34.6	48.0	56.6
	MR (n=1024)	MR (n=549)	MR (n=1215)
	Outpatient Drug Free		
Medical	18.6%	37.7%	45.8%
Psychological	28.6	53.6	73.9
Family/Friends	40.3	60.0	67.2
Job/School	24.6	36.1	43.4
	MR (n=1099)	MR (n=402)	MR (n=1366)

Note: Percentages shown are percentages of clients classified in a depression symptom category who reported particular types of drug-related problems. Because clients could report multiple problems, neither the rows nor the columns add to 100 percent. The MR indicates clients could provide multiple responses within each column.

Each type of drug-related problem was more commonly reported among clients with depression and suicidal symptoms. These other problems may necessitate intensive treatment for depressed and suicidal clients in drug treatment programs. The nature of the causal relationship among depression symptoms and drug-related problems should be explored more fully to determine how they interact to affect the course and outcome of treatment.

SERVICES RECEIVED

The extensive array of drug-related problems reported by the depressed and suicidal clients in each modality suggests the need for ancillary services, particularly psychological and family services. These needs appear to be only partially met.

Tables 17 and 18 and the following paragraphs describe the three depression symptom categories in terms of the number and types of services clients received during their first 3 months in treatment. Because detoxification treatment is usually completed in less than 1 month, few ancillary services are provided. Therefore, detoxification programs are not included in this discussion.

In methadone programs, the suicidal group had smaller percentages of clients who received no ancillary services. The suicidal group also had larger percentages of clients who received psychological services or services especially for mental health problems (22.1%) than the depressed (11.1%) or nondepressed (13.7%) groups. The depressed and suicidal categories had higher proportions of clients who received family services than the nondepressed group. Very few methadone clients received other kinds of ancillary services.

In residential programs, as in methadone, more clients in the suicidal groups reported receiving multiple types of services, and fewer reported receiving no ancillary services than the average client. The suicidal group also had larger percentages of clients who received psychological services. Although substantial percentages of clients received services for medical, family, legal, and educational problems, the relationship between receipt of a service and membership in a depression symptom category is not clear. In general, it appears that depressed and suicidal clients were more likely to receive medical and family services. The rates for these two groups were about 10 percent higher than the rate for the nondepressed group.

In the outpatient drug free modality, the suicidal group had a larger than average percentage of clients who reported receiving two or more ancillary services (67.2%) than the depressed (54.5%) or nondepressed (52.8%) groups. The suicidal group also had a smaller percentage of clients who reported receiving no ancillary services. The majority of OPDF clients reported receiving two or three types of services, especially psychological, family, and medical services. For all three of these service types, the suicidal group had larger percentages of clients who received these services than the nondepressed group or the average for all clients. The differences were most noticeable for psychological services where 82.8 percent of the suicidal group received services compared to about 60 percent of the nondepressed and depressed groups. Very few OPDF clients received other types of ancillary services.

Table 17

Number of Services Received During the First 3 Months in Treatment by Clients in Three Depression Symptom Categories

Number of Different Types of Services	Depression Symptom Category		
	Nondepressed	Depressed	Suicidal
	Outpatient Methadone		
None	52.8%	51.6%	42.9%
1	29.2	29.2	34.1
2 - 3	17.1	17.7	20.2
4 - 7	0.9	1.5	2.9
Total	100.0% (n=981)	100.0% (n=578)	100.0% (n=692)
	Residential		
None	9.8%	6.9%	3.7%
1	18.2	15.8	12.9
2 - 3	54.2	55.2	52.6
4 - 7	17.8	22.2	30.8
Total	100.0% (n=398)	100.0% (n=195)	100.0% (n=444)
	Outpatient Drug Free		
None	23.1%	20.3%	13.5%
1	24.1	25.3	19.3
2 - 3	43.7	43.1	57.0
4 - 7	9.1	11.4	10.2
Total	100.0% (n=299)	100.0% (n=122)	100.0% (n=326)

Note: Depression symptom category is based on reports of depression during the year before treatment.

Table 18

Types of Services Received During the First 3 Months in Treatment by Clients in Three Depression Symptom Categories

Service Received	Depression Symptoms Category		
	Nondepressed	Depressed	Suicidal
	Outpatient Methadone		
Medical	33.2%	35.1%	36.1%
Psychological	13.7	11.1	22.1
Family	6.3	10.7	11.8
	MR (n=981)	MR (n=578)	MR (n=692)
	Residential		
Medical	71.9%	80.5%	84.9%
Psychological	49.7	50.8	68.0
Family	23.4	35.9	38.7
	MR (n=398)	MR (n=195)	MR (n=444)
	Outpatient Drug Free		
Medical	22.4%	25.4%	30.4%
Psychological	59.2	61.5	82.8
Family	40.5	38.5	49.7
	MR (n=299)	MR (n=122)	MR (n=326)

Note: Percentages shown are percentages of clients classified in a depression symptom category who reported receiving service. Because clients may have received more than one type of service, therefore, neither rows nor columns add to 100 percent. MR indicates clients could provide multiple responses within each column. Depression symptom category is based on reports of depression during the year before treatment.

It seems that the residential and OPDF programs were more likely than methadone programs to treat suicidal clients differentially. In all three modalities, psychological services were the most likely to be differentially provided to the suicidal clients.

SUMMARY

In this chapter, the general pattern of results for the characteristics, problems, and treatment of clients with different levels of depression symptoms found in the previous chapter was presented. Groups of clients reporting symptoms of depression and suicide had larger proportions of female, younger, white, and multiple nonnarcotic-using clients than the nondepressed group. Although these profiles confirm that clients with these characteristics have a relatively higher risk of suicidal symptoms, the profiles of the suicidal group show that, in absolute terms, there were large numbers of clients in low risk groups such as black males aged 21-30 who also reported suicidal symptoms. Suicidal thoughts and attempts were reported by all types of drug users. The diagnosis and treatment of depression and suicidal symptoms may be complicated by the diverse characteristics of the clients falling into these groups.

Diagnosis and treatment are further complicated by the extensive array of drug-related problems reported by clients with depression and suicidal symptoms. Depressed and suicidal clients reported a wide array of problems, including medical, psychological, family/friend or job/school problems.

Although depressed and suicidal clients appear more likely to have received more types of services than nondepressed clients, these clients' greater need for services may not be met. Psychological service was the only type of service which was clearly more likely to be delivered to clients with depression or suicidal symptoms.

5. DEPRESSION SYMPTOMS DURING TREATMENT

Given the frequency of reports of depression symptoms and the potential effects of depression on treatment outcome and mental health in general, reducing levels of depression symptoms, particularly suicidal thoughts and attempts, should be an important treatment goal. To examine the possible impact of treatment on level of depression symptoms, responses in the TOPS interview forms at intake and at 1 month and 3 months in treatment were compared. Clients in detoxification programs were not included in this analysis because such programs are usually completed in less than 1 month.

The TOPS intake interviews elicited information about the clients' depression symptoms during the year before treatment. It was felt that this time period would provide a fairly complete and comprehensive assessment of depression symptoms. The intreatment interviews (administered at 1 month, 3 months and quarterly thereafter for up to 2 years as long as the client remained in treatment) elicited information on depression symptoms during the 1- or 3-month period since the previous interview. Because the time periods differed, direct comparisons of rates of depression symptoms before and during treatment need to be qualified. If a pretreatment baseline of 3 months rather than a year were used, we might expect lower pretreatment rates.

Patterns of depression symptoms before and during treatment were examined, and the correlates of the patterns were described. Logistic regression models were used to predict suicidal thoughts and attempts during the first 3 months of treatment. The predictive variables in the models include pretreatment characteristics and behaviors as well as depression symptoms in the year before treatment and extent of psychological services during the first 3 months of treatment.

PREVALENCE DURING TREATMENT

As shown in table 19, data from the TOPS intake and intreatment interviews indicated that reports of depression symptoms declined markedly during the first month in treatment. In general, the rate dropped from about 60 percent in the year before treatment to about 20 to 30 percent during the first month. The rate increased somewhat at 3 months and then fell slightly at 6 months. While the percentages of clients reporting depression symptoms remained relatively constant over time, the numbers of clients remaining in treatment declined sharply, especially in the residential and OPDF modalities. Direct comparison of pretreatment and intreatment depression reports

Table 19

Percentages of Clients Reporting Any Depression Symptoms
Before and During Treatment by Intake Modality/Environment

Modality/Environment by Duration of Treatment	Periods Covered in Interview			
	Year Before Treatment	Intake-1 Month	Intake-3 Months	3-6 Months
Outpatient Methadone				
Intake (n=4140)	53.7%	-	-	-
1 Month (n=3027)	54.4	25.3%	-	-
3 Months (n=2299)	56.2	26.3	29.3%	-
6 Months (n=1612)	57.5	25.3	29.2	29.3%
Residential				
Intake (n=2875)	63.30%	-	-	-
1 Month (n=1893)	63.0	23.4	-	-
3 Months (n=1084)	61.5	21.4	22.6%	-
6 Months (n=561)	59.5	19.6	22.8	19.4%
Outpatient Drug Free				
Intake (n=2889)	61.5%	-	-	-
1 Month (n=1446)	60.6	31.3%	-	-
3 Months (n=775)	60.2	33.1	34.6%	-
6 Months (n=335)	59.1	31.3	35.5	29.6%

Note: For each time period, the reports of only those clients who remained in treatment for that length of time are presented. For example, 2,299 methadone clients remained in treatment for 3 months; 29.3% of those clients reported experiencing at least one depression indicator during those 3 months. Similarly, 335 OPDF clients remained in treatment for 6 months; 29.6% of those clients reported experiencing at least one depression indicator during the second trimester in treatment.

would necessitate following only those clients who stayed at least a full year in treatment and who completed all the scheduled interviews. Unfortunately, the number of such clients is small. Therefore, the remaining sections of this chapter focus on comparisons of the year before treatment and the first 3 months in treatment.

PATTERNS OF CHANGE

Finding reductions of roughly 30 to 40 percent within 1 month of admission into treatment suggests that much of the depression reported at intake was reactive, transient, or situational rather than a chronic mental health problem. If a shorter baseline period had been used, the pretreatment rate might have been lower but, still, substantial portions of the clientele in all modalities were depressed. Obviously, early identification and treatment of the 20 to 30 percent of clients who remain depressed for long periods could be important to the overall effectiveness of the drug abuse treatment program.

To assess how reports of depression symptoms changed during the first 3 months in treatment for various subgroups of clients, a change scoring scheme was created. Based on the assumption of a hierarchy of severity (no symptoms < felt depressed < thought of suicide < attempted suicide), clients were categorized according to the most severe symptoms reported in the year before treatment and after 3 months in treatment.

While overall prevalence rates provide important information on the extent of changes, they obscure critical clinical data on the patterns of change. Table 20 summarizes a number of the major patterns of change observed between the year before treatment and the first 3 months in treatment. With a few notable exceptions, the pattern distribution was very similar across the three modalities. The major exception was the high proportion of residential clients (27.9%) who reported suicidal thoughts or attempts before treatment and reported no depression symptoms during treatment. At the other extreme, a very high proportion (17.7%) of outpatient drug free clients continued to report suicidal thoughts during treatment.

Indices of remission and relapse of depression and suicidal symptoms can be constructed to summarize these data. The formula below divides the clients reporting a symptom before treatment but not during treatment by all clients who reported the symptom before or during treatment to calculate a remission rate.

$$\text{Symptom Remission} = \frac{\text{Clients reporting symptom before treatment}}{\text{Clients reporting symptom before } \underline{\text{or}} \text{ during treatment}}$$

The intreatment suicidal remission rates were 65.1 for methadone, 79.4 for residential, and 50.0 for outpatient drug free programs. Apparently residential programs had the strongest impact on reducing pretreatment and during-treatment suicidal thoughts and attempts. The intreatment depression remission rates were 62.6 for methadone, 75.3 for residential, and 54.1 for outpatient drug free, a pattern similar to that for suicidal remission.

Various relapse rates can also be calculated by combining categories to indicate levels of depression or suicidal symptoms which continue or emerge during treatment. The denominator would exclude those clients who reported depression symptoms neither before nor during treatment.

Table 20

Patterns of Depression and Suicidal Symptoms During the Year Before Treatment and During the First 3 Months of Treatment

Symptoms Before/During Treatment	Modality/Environment: Outpatient Methadone (n=2265)	Residential (n=1061)	Outpatient Drug Free (n=768)
No Problem Either Period			
No Symptoms/No Symptoms	37.4%	35.2%	36.1%
Reduced Depression			
Depressed/No Symptoms	17.4	14.4	10.4
Suicidal/No Symptoms	16.0	27.6	19.0
Suicidal/Depressed	5.7	7.2	4.7
Continued or Increased Depression			
No Symptoms/Depressed	4.6	2.6	1.6
Depressed/Depressed	7.2	3.3	3.6
Continued or Increased Suicidal Tendencies			
No Symptoms or Depressed/ Suicidal	2.9	1.3	4.0
Suicidal/Suicidal Thoughts	7.1	8.0	18.0
Suicidal/Suicide Attempts	1.7	0.4	2.6
Total	100.0%	100.0%	100.0%

EFFECTS OF CLIENT CHARACTERISTICS

While depression and suicidal thoughts and attempts before treatment are clearly the strongest predictors of suicidal thoughts and attempts during treatment, other characteristics such as sex, age, prior treatment or drug use pattern may also affect symptoms. The following sections discuss the bivariate and multivariate relationships of a variety of client characteristics with suicidal thoughts and attempts.

Demographic Characteristics

In all three modalities, females were more likely than males to have reduced their reports of depression symptoms during the first 3 months in treatment. It should be noted, however, that females were more likely to be depressed before treatment. DeLeon (1984), using the Beck depression inventory with a group of clients in a therapeutic community, reported very similar findings: Women were more symptomatic at initial testing and showed greater reductions

in symptoms at followup. However, when logistic regression was used to predict suicidal thoughts and attempts during treatment in TOPS, no significant differences between males and females were found after controlling for initial level of depression.

While differences were evident for some modalities in some cohorts, no pattern in the relationship between age and change in depression symptoms was apparent. The major differences found in the logistic regression were that OPDF clients over 30 had a 2.59 times greater risk of reporting suicidal thoughts or attempts during treatment than did clients under 21 ($p < .002$). The followup data reported in the next chapter deal with only the 1979 and 1980 cohorts, however, and some differences have been found between the cohorts.

In methadone programs, black clients were less likely to have reduced their level of depression during the first 3 months in treatment but were also less likely to have reported any depression symptoms before treatment. Among residential clients, there was no clear relationship between race and changes in depression symptoms. In the OPDF modality, fewer than 8 percent of the clients were black. The findings, similar to those observed for residential clients, should, therefore, be used cautiously. In the results of the logistic regression, white clients in all modalities were more likely to report suicidal thoughts during treatment even after adjustment for pretreatment depression symptoms. The greatest risk was for white clients in residential programs with a risk factor of 3.03 ($p < .001$).

Prior Treatment and Source of Referral

The changes in depression reported by methadone clients with particular numbers of prior treatment admissions were slight, varied, and seemed to follow no particular pattern. In residential and OPDF programs, the number of prior treatment episodes was unrelated to change in depression symptoms.

The results of the regression after adjusting for other factors indicated that methadone clients with three or more prior treatment admissions were 1.64 times more likely to report suicidal thoughts or attempts than clients with no prior admissions ($p < .03$). Residential clients with one or two prior admissions had the lowest risk--only .61 times the risk of clients with three or more admissions ($p < .11$); but OPDF clients with one or two prior admissions had the highest risk--1.87 times the risk of clients with three or more prior admissions ($p < .05$).

Methadone clients referred to treatment through the criminal justice system were less likely to show a reduction in depression than clients referred from other sources. It must be noted, however, that methadone clients were not likely to report pretreatment depression symptoms. In residential programs, clients referred through "other"--primarily community agency or medical--sources were consistently more likely to report depression symptoms before treatment and were more likely to increase their suicidal tendencies and reduce their depression during treatment in all three cohorts. Legally referred clients were less likely to reduce their depression than clients from any of the other referral sources. Among OPDF clients, those referred through the criminal justice system were less likely to increase suicidal

tendencies and were more likely to have reported no depression symptoms before treatment or after 3 months in treatment. Other differences in changes in depression symptoms between clients referred by different sources were sporadic. The results of the regression analysis, after adjusting for other factors, indicated that residential clients referred by family and friends ($p < .08$) and OPDF clients referred from the legal system had the lowest risk ($p < .03$) of suicidal thoughts or attempts.

Drug Use Patterns

The relationship between alcohol use and change in depression symptoms is neither strong nor clear. Heavy drinkers were slightly less likely to report any depression symptoms before treatment or during the first 3 months in treatment. Other differences were sporadic with no clear pattern emerging.

In methadone programs, those in the single or multiple nonnarcotics pattern during the year before treatment were more likely to increase their suicidal tendencies during treatment. In residential treatment programs, clients in the multiple nonnarcotics and narcotics (not heroin) patterns were more likely to report depression symptoms and more likely to increase their suicidal tendencies. In the OPDF programs, the percentages of clients in the three heroin/narcotic abuse categories, the multiple nonnarcotics category, and the minimal use category were too small to permit meaningful interpretation of the data. Clients in the two remaining drug use pattern groups (single nonnarcotic and alcohol and/or marijuana) were not appreciably different from one another. The logistic regression revealed no clear risk factors by drug use pattern.

Other Characteristics

There was a clear relationship between change in depression and degree of involvement with the drug use network in all modalities: the higher the involvement, the more likely the client was to have reduced depression during the first 3 months in treatment. However, because those with higher involvement were more likely to report pretreatment depression symptoms, the strength of this relationship is unclear. In OPDF, this high involvement group was much more likely to increase their suicidal tendencies than the lower involvement clients. This was true to a much lesser extent in the methadone and residential modalities.

In methadone programs, the number of predatory illegal acts before treatment appeared to be unrelated to change in depression symptoms. In outpatient drug free and residential programs, those who reported more such acts were more likely to be less depressed after 3 months in treatment. There appears to be no systematic relationship between the number of weeks of full-time work during the year before treatment and change in depression level during the first 3 months of treatment.

NATURE OF TREATMENT

In methadone programs, no relationship between change in depression symptoms and number of types of ancillary services received was found. In residential programs, however, those who received more types of services were more likely

to report depression symptoms before treatment and more likely to reduce their depression after 3 months in treatment. Generally, in the OPDF programs, those receiving more types of services were more likely to increase their reports of suicidal thoughts and attempts. Reduction in depression symptoms appeared to be unrelated to the number of ancillary services received by OPDF clients.

In the logistic regression, a variable identifying weekly, less than weekly, or no psychological services was included. The simple hypothesis was that clients who receive psychological services will be less likely than those with similar levels of pretreatment depression who receive no services to report depression symptoms. This is not the case. Only in residential programs does the more intensive weekly psychological service seem to result in lower reports of suicidal thoughts or attempts. In methadone programs, clients receiving weekly services were 1.37 times more likely ($p < .14$) to report suicidal symptoms during the first 3 months of treatment than clients receiving no psychological services. The risk factors for clients receiving weekly services were 2.55 ($p < .001$) in OPDF programs but only 1.04 (which is not statistically significant) in residential programs. However, in residential programs, clients receiving less than weekly services had a risk factor of 1.61 ($p < .15$).

The results clearly refute the hypothesis that increased services result in fewer suicidal symptoms, at least within a short treatment period. The reason may be that clients with more severe symptoms are diagnosed and receive more intensive treatment. It may be unreasonable to expect the impact of psychological services to be seen immediately. The nature and extent of services and the accuracy with which depression symptoms are diagnosed are two areas that seem to require careful clinical study.

SUMMARY

After the first 3 months in treatment, reports of depression were much lower than in the year before treatment. Although some of the difference is obviously due to the 3-month (rather than 1-year) time period, the remission rates are still impressive. There were, however, a number of clients who continued to report depression symptoms during treatment and a small proportion of clients who were symptom-free before treatment and who became depressed during treatment.

A number of factors appear to be related to a higher risk of reporting suicidal thoughts or attempts during the first 3 months of treatment (see table 21). Clearly, suicidal thoughts in the year before treatment were a major risk factor. White clients, even after controlling for pretreatment depression symptoms, were still at greater risk than black clients, especially in residential programs. However, the comparative risk for males and females during treatment was not significantly different. Three or more prior treatment admissions resulted in a significantly higher risk for methadone clients but not for clients in the other modalities. These findings again point out that there were critical differences among the client populations in each of the major treatment modalities in terms of the factors that affect the nature and course of depression symptoms.

Table 21

Comparative Risk Factors for Suicidal Thoughts and Attempts During the First 3 Months of Treatment

Risk Factor	Outpatient Methadone	Residential	Outpatient Drug Free
Suicidal thoughts vs. no depression symptoms	7.67**	10.04**	10.89**
Female vs. male	1.21	1.12	1.07
White vs. black	1.43	3.03**	1.47
Three or more admissions vs. no prior admissions	1.64*	1.11	.87
Weekly psychological services vs. no services	1.37	1.04	2.55**

*p<.05
**p<.001

The impacts of psychological services on suicidal symptoms were also examined. Contrary to expectation, psychological services appeared to increase the risk of reporting suicidal symptoms during treatment, particularly for OPDF clients. One explanation for this result may be that psychological services were provided to the most depressed clients. The patterns of services and symptoms should be followed over the complete course of treatment and at followup to determine more precisely the dynamic nature of the relationship of psychological services and suicidal symptoms. Clearly, this relationship is complex and requires careful clinical study.

6. DEPRESSION SYMPTOMS AFTER TREATMENT

A key question is whether the substantial changes in depression symptoms and suicidal symptoms during treatment are maintained after treatment. In this chapter, posttreatment reports of depression symptoms are examined to determine if intreatment reductions in suicidal symptoms persisted. Multivariate analyses are used to assess whether the longer clients stayed in treatment, the lower the risk that they would report suicidal thoughts or attempts after treatment.

METHODOLOGY

This section presents findings from the TOPS followup data collection of random samples of the 1979 and 1980 admission cohorts. The 1979 cohort was interviewed at 12 months and 24 months after leaving treatment. The 1980 cohort was interviewed at 3 months and 12 months after treatment. Followup data for the 1981 cohort are still being collected.

Measures

Most of the before-treatment measures (e.g., depression symptoms and drug-related problems) discussed in the previous sections covered the year before admission to the TOPS program. In contrast, the followup interviews covered 3-month periods before the scheduled date of the followup interview (i.e., 1-3 months, 10-12 months, and 22-24 months after treatment). Therefore, the comparison periods available for before and after treatment are not the same. Obviously, depression symptoms are more likely to occur in a 12-month (pretreatment) period than in a 3-month (posttreatment) period, a fact that must be taken into consideration when interpreting the findings presented in this section.

Because the 10-12 month posttreatment period was assessed for both the 1979 and 1980 cohorts, these data will be used as the major source for comparison and discussion. The 22-24 month followup data for the 1979 cohort and the 1-3 month followup data for the 1980 cohort are described but require more intensive analysis to determine trends and detailed patterns of change.

Sample

Not all TOPS clients were interviewed in the followup phase; rather, a random sample of clients was selected for inclusion and later weighted with adjust-

ment for nonrespondents to represent the population of clients within modalities.

A comparison between pretreatment depression levels for the clients chosen for the followup and those interviewed revealed no major differences in depression symptoms between respondents and nonrespondents. The reader should also note that the numbers of clients identified as short- (less than 3 months) or long-term (3 months or more in treatment) differ somewhat from the numbers reported in the preceding chapters because time-in-treatment data were updated based on followup information and some programs with small client populations were excluded from consideration for the followup sample. To maintain consistency with previous TOPS reports and data books, the original time-in-treatment designation was used in the previous chapters of this report. In this chapter, the updated time-in-treatment data are used.

Analysis

To identify risk factors for posttreatment depression, logistic regression models were developed for each modality. The independent variables included in the models were selected on the basis of the crosstabulations discussed in the previous sections of this report. The basic variables included age, race, sex, prior treatment, source of referral, pretreatment drug patterns, and time in TOPS treatment. To adjust for pretreatment level of depression, the four-category depression index was used (not depressed, depressed, suicidal thoughts, and suicide attempts). To adjust for the effect of post-TOPS treatment, a variable indicating no treatment, a readmission to treatment, or continuing treatment in the year after TOPS treatment was also included. The logistic regression procedure uses variables that dichotomize clients as members or nonmembers of some group. For example, age was included in one of the models as three dichotomous or dummy variables (20 or younger, 21-25, 26-30), with all clients classed as belonging or not belonging to each of the three age groups. The remaining group, clients over age 30, served as the reference group for this set of variables. Simply stated, this type of regression analysis provides information on whether membership in a group increases or decreases the risk of some outcome or dependent variable (in this case, reporting suicidal thoughts or attempts) as compared to the reference group. Because the clients entering each modality were so different, the results are presented within modality.

OUTPATIENT DETOXIFICATION

Outpatient detoxification provides only minimal treatment or ancillary services during the 28-day treatment period. Any change in depression symptoms among detoxification clients might be viewed as natural remission or relapse rather than a treatment outcome. Thus, the depression rates may serve as a baseline for comparison. In table 22 we see that rates of suicidal thoughts and attempts were lower in all the posttreatment periods. Little difference is seen between the 1979 and 1980 cohorts or over the three posttreatment time periods. In table 23 we see the patterns of changes in depression symptoms. The suicidal remission rate was 57.8 percent, and the depression symptom remission rate was 49.3 percent.

Table 22

Suicidal Thoughts or Attempts Before and After Outpatient Detoxification

Time Period	1979 Cohort Percentage	1979 Cohort n	1980 Cohort Percentage	1980 Cohort n	Combined Percentage	Combined n
Year before treatment	35.2	522	31.1	307	33.5	829
First 3 months after treatment	-	-	12.4 (±4.1)	131	-	-
10-12 months after treatment	18.4 (±6.5)	107	16.2 (±5.0)	121	17.7 (±4.6)	228
22-24 months after treatment	18.7 (±6.8)	92	-	-	-	-

Note: (±) indicates 95% confidence interval for the sample estimate. Dashes in a cell indicate that clients in the cohort were not asked questions about this period or, in the case of the combined cohort columns, that clients in both cohorts were not asked questions about this period.

Table 23

Patterns of Depression and Suicidal Symptoms During the Year Before Treatment and During the 10-12 Months After Outpatient Detoxification

Symptoms Before/After Treatment	Detoxification (n=228)
No Problem Either Period	
No Symptoms/No Symptoms	38.3%
Reduced Depression	
Depressed/No Symptoms	12.9
Suicidal/No Symptoms	17.5
Suicidal/Depressed	5.4
Continued or Increased Depression	
No Symptoms/Depressed	4.6
Depressed/Depressed	3.8
Continued or Increased Suicidal Tendencies	
No Symptoms or Depressed/Suicidal	4.7
Suicidal/Suicidal Thoughts	10.8
Suicidal/Suicide Attempts	1.9
Total	100.0%

OUTPATIENT METHADONE PROGRAMS

The results in tables 24 and 25 show substantial reductions in suicidal thoughts and attempts in the 3-month periods after treatment compared to the year before treatment. There are virtually no differences between the long-term clients across the two cohorts. The two cohorts of short-term clients appear to be different; however, the differences may be spurious as there were only 60 short-term clients in the 1979 cohort, resulting in a large standard error. There appear to be no differences over time, or between the long- and short-term groups.

Table 26 breaks down the pattern of symptoms 10-12 months after outpatient methadone treatment. Roughly three-fourths of the clients who were symptom-free during the year before TOPS treatment were also symptom-free at follow-up. In contrast, just over 60 percent of those who reported one or more symptoms before treatment were symptom-free at followup. The suicidal remission rate of 61.8 percent for the short-term clients was about the same as the rate of 65.4 percent for the long-term clients. When the regression model was used to predict posttreatment suicidal thoughts or attempts among methadone clients in the followup sample, only one variable was significant ($p < .05$): black clients were more likely to be symptom-free at followup compared to the reference group (Hispanics and other racial groups). White clients were not appreciably different from the reference group.

Pretreatment depression symptoms were highly related to posttreatment suicidal symptoms. The strongest of the three symptoms was having thought of suicide during the year before entering the TOPS program. Clients in this category were 3.74 times more likely to report suicidal thoughts or attempts in the 10-12 months after treatment ($p < .001$). Similarly, those who had attempted suicide during the year before treatment were also more likely to show some depression symptom at followup. This latter finding, however, is based on only 15 observations and must be accepted with caution. Contrary to what one might expect, the depression symptom was found to be negatively related to posttreatment suicidal symptoms. That is, those who reported feeling so depressed that they could not get out of bed at some time during the year before treatment were less likely to report suicidal thoughts or attempts at followup than the reference group (clients who were symptom-free at admission). Perhaps these clients were more aware of their problems than the symptom-free clients and were, therefore, more motivated to do well in treatment and remain so after treatment. Clients who had thought of or attempted suicide may be more troubled and more refractory or may become suicidal more quickly after leaving treatment.

None of the other variables in the model was significant in this regression. Table 27, however, does show that remaining in methadone programs for longer periods reduces the risk of suicidal symptoms. We should note that the clients leaving methadone programs within 1 week of admission had the lowest risk of suicidal symptoms. Those leaving within 1 year after admission had a risk factor about two times greater than the early dropouts.

Table 24

Suicidal Thoughts or Attempts Before, During, and After Outpatient Methadone Treatment for Short-Term Clients

Time Period	1979 Cohort Percentage	n	1980 Cohort Percentage	n	Combined Percentage	n
Year before treatment	30.7	432	28.1	621	29.2	1053
First 3 months after treatment	-	-	17.8 (±4.8)	193	-	-
10-12 months after treatment	18.1 (±9.7)	60	9.5 (±5.1)	204	12.7 (±4.3)	264
22-24 months after treatment	8.1 (±6.7)	60	-	-	-	-

Note: (±) indicates 95% confidence interval for the sample estimate. Dashes in a cell indicate that clients in the cohort were not asked questions about this period or, in the case of the combined cohort columns, that clients in both cohorts were not asked questions about this period.

Table 25

Suicidal Thoughts or Attempts Before, During, and After Outpatient Methadone Treatment for Long-Term Clients

Time Period	1979 Cohort Percentage	n	1980 Cohort Percentage	n	Combined Percentage	n
Year before treatment	29.6	680	34.5	927	32.5	1607
First 3 months during treatment	11.1	680	12.6	927	12.0	1607
First 3 months after treatment	-	-	10.4 (±4.1)	197	-	-
10-12 months after treatment	14.2 (±3.8)	181	11.6 (±2.7)	418	12.8 (±2.6)	579
22-24 months after treatment	15.3 (±5.3)	147	-	-	-	-

Note: (±) indicates 95% confidence interval for the sample estimate. Dashes in a cell indicate that clients in the cohort were not asked questions about this period or, in the case of the combined cohort columns, that clients in both cohorts were not asked questions about this period.

Table 26

Patterns of Depression and Suicidal Symptoms
During the Year Before Treatment and During the 10-12 Months
After Outpatient Methadone Treatment

Symptoms Before/After Treatment	Duration of Treatment: Short-Term (n=264)	Duration of Treatment: Long-Term (n=579)
No Problem Either Period		
No Symptoms/No Symptoms	34.0%	30.8%
Reduced Depression		
Depressed/No Symptoms	18.6	17.2
Suicidal/No Symptoms	16.8	16.6
Suicidal/Depressed	5.1	6.9
Continued or Increased Depression		
No Symptoms/Depressed	5.9	7.7
Depressed/Depressed	7.1	8.0
Continued or Increased Suicidal Tendencies		
No Symptoms or Depressed/Suicidal	5.8	5.5
Suicidal/Suicidal Thoughts	5.7	6.6
Suicidal/Suicide Attempts	1.1	0.6
Total	100.0%	100.0%

Table 27

Odds Ratios for Suicidal Thoughts or Attempts
During the Year After Outpatient Methadone Treatment
by Duration of Treatment

Duration of Treatment	Odds Ratio	P Value
Less than 1 week[a]	(1.00)	
1-13 weeks	1.93	.106
14-52 weeks	1.83	.107
More than 1 year and discharged	1.51	b
Long-term maintenance	1.39	b

[a]Comparison group.

[b]$p<.20$

RESIDENTIAL PROGRAMS

For residential clients, major differences as a function of time in treatment are expected. While 3 months may not be adequate to demonstrate the impact of the residential treatment experience, this common period does provide a benchmark. The rates of suicidal thoughts and attempts for residential clients were significantly lower after treatment, particularly for the long-term (table 29) compared to the short-term clients (table 28). For the long-term clients in the combined cohorts, only 15.1 percent reported suicidal symptoms 10-12 months after treatment, compared to 21.3 percent for the short-term. The results also suggest that major changes occurred early in treatment and persisted for up to 24 months after treatment.

Pretreatment and posttreatment depression symptoms were crosstabulated for residential clients in the 1979 and 1980 cohort followup samples (see table 30). The crosstabulations were done separately for each cohort and separately for short-term (i.e., <3 months) and long-term (≥3 months) clients within each cohort. Differences between the cohorts were small. Somewhat larger differences were found between the short-term and long-term clients. In particular, short-term clients who had thought of suicide during the year before treatment were more likely to report depression symptoms at followup than long-term clients who had thought of suicide. Also, long-term clients who were depressed before treatment were more likely than short-term clients who were depressed before treatment to report no depression symptoms at followup. Thus, the suicidal remission ratio was 67.3 for the long-term clients and 61.7 for the short-term. A similar difference was found in the depression remission rates: 57.3 for long-term and to 46.1 for short-term.

Table 28

Suicidal Thoughts or Attempts Before, During, and After Residential Treatment for Short-Term Clients

Time Period	1979 Cohort		1980 Cohort		Combined	
	Percentage	n	Percentage	n	Percentage	n
Year before treatment	48.4	527	40.5	539	44.4	1066
First 3 months after treatment	-	-	21.0 (±4.3)	197	-	-
10-12 months after treatment	23.8 (±5.7)	178	18.6 (±4.1)	195	21.3 (±3.6)	373
22-24 months after treatment	24.1 (±6.0)	164	-	-	-	-

Note: (±) indicates 95% confidence interval for the sample estimate. Dashes in a cell indicate that clients in the cohort were not asked questions about this period or, in the case of the combined cohort columns, that clients in both cohorts were not asked questions about this period.

Table 29

Suicidal Thoughts or Attempts Before, During, and After Residential Treatment for Long-Term Clients

Time Period	1979 Cohort Percentage	n	1980 Cohort Percentage	n	Combined Percentage	n
Year before treatment	41.4	338	43.7	385	42.6	723
First 3 months during treatment	9.3	338	9.9	385	9.7	723
First 3 months after treatment	-	-	10.6 (±3.4)	166	-	-
10-12 months after treatment	17.5 (±5.5)	139	13.0 (±3.4)	200	15.1 (±3.1)	339
22-24 months after treatment	9.9 (±4.4)	140	-	-	-	-

Note: (±) indicates 95% confidence interval for the sample estimate. Dashes in a cell indicate that clients in the cohort were not asked questions about this period or, in the case of the combined cohort columns, that clients in both cohorts were not asked questions about this period.

Table 30

Patterns of Depression and Suicidal Symptoms During the Year Before Treatment and During the 10-12 Months After Residential Treatment

Symptoms Before/After Treatment	Duration of Treatment: Short-Term (n=373)	Long-Term (n=339)
No Problem Either Period		
No Symptoms/No Symptoms	28.2%	33.7%
Reduced Depression		
Depressed/No Symptoms	11.5	13.0
Suicidal/No Symptoms	20.9	25.3
Suicidal/Depressed	6.7	5.8
Continued or Increased Depression		
No Symptoms/Depressed	4.6	4.1
Depressed/Depressed	6.7	3.1
Continued or Increased Suicidal Tendencies		
No Symptoms or Depressed/Suicidal	5.8	6.3
Suicidal/Suicidal Thoughts	13.9	6.6
Suicidal/Suicide Attempts	1.6	2.2
Total	100.0%	100.0%

The basic logistic regression model was used to predict posttreatment depression among residential clients who had experienced a depression symptom during the year before treatment. Remaining in treatment more than 1 year (see table 31) was found to be a marginally significant predictor of reduced risk of posttreatment suicidal symptoms ($p < .110$). In addition, two other factors are significant: pretreatment and posttreatment drug abuse treatment experience. Clients with no drug abuse treatment experience before TOPS were 1.64 times less likely ($p < .05$) to report suicidal thoughts or attempts at followup than clients with three or more drug abuse treatment episodes TOPS. Clients readmitted to treatment after TOPS were 1.76 times more likely ($p < .05$) to report suicidal thoughts or attempts at followup than clients who were not readmitted.

Table 31

Odds Ratios for Suicidal Thoughts or Attempts During the Year After Residential Treatment by Duration of Treatment

Duration of Treatment	Odds Ratio	P Value
Less than 1 week[a]	(1.00)	-
1-13 weeks	1.28	b
13-26 weeks	.93	b
26-52 weeks	1.09	b
More than 1 year	.44	.110

[a]Comparison group

[b]$p<.20$

All three of the pretreatment depression symptoms were significant. Those who reported having suicidal thoughts or attempting suicide during the year before the TOPS treatment were approximately 2.62 times more likely ($p < .01$) to report suicidal thoughts or attempts 10-12 months after treatment than clients who were symptom-free before treatment.

OUTPATIENT DRUG FREE PROGRAMS

Significant differences in suicidal thoughts and attempts for OPDF clients in the short-term (table 32) and long-term (table 33) groups were found for the OPDF clients only in the 1980 cohort sample. In the period 10-12 months after treatment, 17.0 percent of the long-term clients reported suicidal symptoms compared to 24.7 percent of the short-term clients. It also appeared that suicidal symptoms were somewhat lower in the second year after leaving treatment.

Table 32

Suicidal Thoughts or Attempts Before, During, and After Outpatient Drug Free Treatment for Short-Term Clients

Time Period	1979 Cohort Percentage	1979 Cohort n	1980 Cohort Percentage	1980 Cohort n	Combined Percentage	Combined n
Year before treatment	49.3	621	48.9	834	49.0	1455
First 3 months after treatment	-	-	29.7 (±3.7)	316	-	-
10-12 months after treatment	26.9 (±5.8)	183	24.7 (±3.6)	323	25.7 (±3.2)	506
22-24 months after treatment	21.6 (±6.0)	167	-	-	-	-

Note: (±) indicates 95% confidence interval for the sample estimate. Dashes in a cell indicate that clients in the cohort were not asked questions about this period or, in the case of the combined cohort columns, that clients in both cohorts were not asked questions about this period.

Table 33

Suicidal Thoughts or Attempts Before, During, and After Outpatient Drug Free Treatment for Long-Term Clients

Time Period	1979 Cohort Percentage	1979 Cohort n	1980 Cohort Percentage	1980 Cohort n	Combined Percentage	Combined n
Year before treatment	45.5	269	44.5	295	45.0	564
First 3 months during treatment	20.8	269	23.5	295	22.0	564
First 3 months after treatment	-	-	14.6 (±4.3)	152	-	-
10-12 months after treatment	26.4 (±6.8)	132	17.0 (±3.8)	190	21.4 (±3.8)	322
22-24 months after treatment	17.4 (±6.1)	125	-	-	-	-

Note: (±) indicates 95% confidence interval for the sample estimate. Dashes in a cell indicate that clients in the cohort were not asked questions about this period or, in the case of the combined cohort columns, that clients in both cohorts were not asked questions about this period.

Crosstabulations of the OPDF clients' pretreatment and posttreatment depression symptoms were carried out for the 1979 and 1980 cohorts using the 12-month followup data (see table 34). Most of the differences between the short-term and long-term groups were negligible as were the differences between the cohorts. The few sizeable differences observed were not clearly interpretable. Roughly 75 to 85 percent of those who reported no depression symptoms for the year before treatment also said they were symptom-free during the period 10 to 12 months after treatment. In general, just over half of those who had one or more depression symptoms before treatment reported no sign of depression in the posttreatment period. Suicidal remission rates were about 57 percent in both the short- and long-term groups.

Table 34

Patterns of Depression and Suicidal Symptoms
During the Year Before Treatment and During the 10-12 Months
After Outpatient Drug Free Treatment

Symptoms Before/After Treatment	Duration of Treatment	
	Short-Term (n=506)	Long-Term (n-=322)
No Problem Either Period		
No Symptoms/No Symptoms	27.4%	31.6%
Reduced Depression		
Depressed/No Symptoms	8.6	10.3
Suicidal/No Symptoms	24.1	24.7
Suicidal/Depressed	7.6	4.4
Continued or Increased Depression		
No Symptoms/Depressed	4.0	2.2
Depressed/Depressed	2.4	5.4
Continued or Increased Suicidal Tendencies		
No Symptoms or Depressed/Suicidal	6.0	5.4
Suicidal/Suicidal Thoughts	15.6	14.0
Suicidal/Suicide Attempts	4.2	2.1
Total	100.0%	100.0%

The logistic regression model was then used to predict posttreatment depression for all OPDF clients in the followup sample. Clients with three or more drug abuse treatment episodes before admission to the TOPS program were 1.55 times more likely to report suicidal thoughts or attempts after treatment. White clients were also 1.60 times more likely than black or Hispanic clients to report suicidal thoughts or attempts. The odds were much greater that those who had thought of (risk factor = 4.15) or attempted suicide (risk factor = 6.26) would report suicidal thoughts or attempts after treatment ($p < .0001$).

Time in treatment (see table 35) was not strongly related to suicidal symptoms after treatment. Those clients staying in treatment more than 26 weeks were .67 times as likely to report symptoms as clients leaving within 1 week ($p < .185$).

Table 35

Odds Ratios for Suicidal Thoughts or Attempts During the Year After Outpatient Drug Free Treatment by Duration of Treatment

Duration of Treatment	Odds Ratio	P Value
Less than 1 week[a]	(1.00)	-
1-13 weeks	1.07	b
14-26 weeks	1.15	b
More than 26 weeks	.67	.185

[a]Comparison group

[b]$p<.20$

SUMMARY

After treatment a substantially lower proportion of clients reported suicidal thoughts or attempts than before treatment. The lower level of suicidal symptoms achieved during treatment appeared to be maintained after treatment in all modalities. Although there was substantial improvement, 10-25 percent of clients still reported suicidal thoughts or attempts in all posttreatment periods. Approximately 2-3 percent reported suicide attempts. Thus, although treatment appeared to help reduce levels of depression, depression and suicidal tendencies continued to be a problem for a large number of clients.

Table 36 summarizes the risk factors associated with suicidal thoughts or attempts 10-12 months after treatment after adjusting for other factors. As expected, suicidal thoughts and attempts in the year before treatment were major risk factors. The depression symptom "could not get out of bed" was not related to posttreatment suicidal symptoms. Time in treatment or extent of service was not found to be related to posttreatment suicidal symptoms. Three other risk factors were found, but their importance varied by modality. In OPDF programs, white clients had a higher risk of suicidal symptoms than black clients. Clients in residential and OPDF programs with three or more prior treatments were also at higher risk for suicidal symptoms after treatment. Posttreatment readmission to a drug abuse treatment program was a significant risk factor for residential clients. Again we see that clients from the different modalities appeared to have different risk factors contributing to suicidal symptoms. More detailed knowledge of the course of treatment and the factors that affect that course may suggest more effective approaches to treating symptoms of depression and suicide. The results

reported in this chapter reemphasize the fact that depression is a serious and chronic problem among individuals who are abusing or have abused drugs despite their experience in drug abuse treatment programs.

Table 36

Comparative Risk Factors for Suicidal Thoughts and Attempts During the Year After Treatment

Risk Factor	Outpatient Methadone	Residential	Outpatient Drug Free
Suicidal thoughts versus no depression symptoms	3.74**	2.62**	4.15**
White vs. black	1.30	.72	1.60
Three or more prior treatments vs. no prior treatment	1.03	1.64*	1.55
Posttreatment readmission vs. no readmission	NA	1.76*	1.17

NA = Not ascertained because of the large number of clients remaining in methadone treatment.
*p<.05 **p<.001

7. CONCLUSIONS

Previous research established a clear link between drug use and depression, both in the general population and among drug abusers. This report focused on describing the nature, extent, treatment, course, and correlates of drug abusers' depression symptoms before, during, and after drug abuse treatment. The sample included over 11,000 clients entering 41 detoxification, outpatient methadone, residential, and outpatient drug free programs in 10 U.S. cities from 1979-1981. Random samples of clients admitted to treatment are being followed 3 months, 12, and 24-48 months after termination. A three-item scale asking about inability to get out of bed because of depression, suicidal thoughts and suicide attempts was developed for the survey instruments. A validation study comparing the three-item scale used in TOPS with three clinically established depression scales (Beck, CES-D, and Koss and Butcher MMPI Subscale) indicated this brief summary measure is a valid and useful indicator of depression and suicide.

PREVALENCE OF DEPRESSION SYMPTOMS

The TOPS measure of depression symptoms indicates that depression is very common among clients entering treatment. About 60 percent of TOPS clients reported experiencing at least one depression symptom in the year before treatment. The most susceptible group was females under 21 years of age: nearly 75 percent reported one or more depression symptoms. Prevalence rates varied somewhat across treatment modalities. In all three cohorts, about half of the detoxification and methadone clients reported a symptom compared to two-thirds of the residential or OPDF clients. Only about one in 20 detoxification or methadone clients reported a suicide attempt compared to one in 10 residential or OPDF clients.

These results clearly showed that clients entering OPDF and residential programs were more likely to be depressed. A more important clinical question, however, is whether a depressed client is more likely to select or be referred to a particular modality. After adjusting for other risk factors such as sex, age, race, and drug use pattern, clients entering residential or OPDF programs were about 2.5 times more likely to report suicidal thoughts or attempts in the year before treatment than clients entering outpatient methadone programs. Thus, both the prevalence of suicidal symptoms and the relative risk of suicidal symptoms were significantly higher for clients entering residential and OPDF drug abuse treatment programs. These results demonstrate the need for careful diagnosis to identify depression, especially among OPDF and residential clients.

CORRELATES OF DEPRESSION SYMPTOMS

Clients with several types of characteristics and treatment experiences reported high rates of depression symptoms for the year before treatment. Females were more likely to report depression symptoms than males, and black clients were less likely to experience depression symptoms than clients of other racial or ethnic backgrounds. A history of mental health treatment was predictive of depression symptoms; however, prior drug abuse treatment was unrelated to depression symptoms in OPDF and residential programs. As might be expected, the number of drug-related problems reported by clients was positively related to depression symptoms. Clients in the multiple nonnarcotics drug use pattern were more likely to report depression symptoms than those in other drug use patterns. Also, clients who were more heavily involved in the drug use network or drug culture were more likely to be depressed.

Risk factors related to suicidal thoughts and attempts may also provide some guidance for targeting services. A variety of factors was examined in a logistic regression model. Some characteristics, such as being female, white, and using multiple nonnarcotic drugs, were major risk factors regardless of the modality. In methadone programs, referral from a source other than the criminal justice system and three or more prior treatment episodes were key risk factors. In residential programs, use of heroin with other narcotics and referral from a community agency increased the risk of suicidal symptoms. In outpatient drug free programs, self-referral or referral from a source other than the criminal justice system increased the risk of reporting suicidal symptoms.

These analytical results confirmed other studies' findings with different populations. Males and blacks were less likely to report depression symptoms. Analytical results for drug use patterns, referral source, and prior treatment were more specific to drug abuse treatment programs. Knowledge of these risk factors should help clinicians identify clients at higher risk for depression.

DRUG-RELATED PROBLEMS AND TREATMENT OF DEPRESSED AND SUICIDAL CLIENTS

Profiles of clients with different levels of depression symptoms confirmed that clients with high risk characteristics (young, female, multiple nonnarcotic users) had a relatively higher prevalence of suicidal symptoms. The profiles of the suicidal group also showed that large numbers of clients with no risk factors (such as male clients aged 21-30) reported suicidal symptoms. Because suicidal symptoms were found among all types of drug users, the diagnosis and treatment of depression and suicidal symptoms may be complicated by the diverse characteristics of depressed or suicidal clients.

A further complication for diagnosis and treatment is the extensive array of drug-related problems reported by clients in general and, particularly, those with depression symptoms. In all modalities, clients who reported one or more depression symptoms in the year before treatment also reported more medical, psychological, family/friend or job/school problems than symptom-free clients.

When the nature of services reported by these clients was examined, it appeared that depressed and suicidal clients were more likely to receive more types of services. Depressed clients' greater need for services, however, may not be met. Psychological services were the only type of service which was clearly more likely to be delivered to depressed or suicidal clients.

PATTERNS AND CORRELATES OF DEPRESSION SYMPTOMS DURING TREATMENT

During the first 3 months in treatment, depression symptoms were reported less often than in the year before treatment. Although some of the difference is obviously due to the more restricted 3-month time period, the remission rates are still impressive. However, a number of clients continued to report depression symptoms during treatment and a small proportion of clients who were symptom-free before treatment became depressed during treatment.

A number of factors appeared to be related to reporting suicidal thoughts or attempts during the first 3 months of treatment. Clearly, suicidal thoughts or attempts in the year before treatment were major risk factor. Even after controlling for the pretreatment depression symptoms, however, white clients still were at greater risk than black clients, especially in residential programs. The comparative risk for males and females during treatment, however, was not significantly different. Three or more prior treatment admissions resulted in a significantly higher risk for only methadone clients. These findings again point out that the differences between the client populations in each of the major treatment modalities are critical factors affecting the nature and course of depression symptoms.

The complex relationship of psychological services to suicidal symptoms also was examined. Contrary to expectation, psychological services appeared to increase the risk of suicidal symptoms during treatment, particularly for OPDF clients. One explanation for this may be that psychological services were provided to the most depressed clients. The pattern of services and symptoms should be followed over the complete course of treatment and at followup to determine more precisely the dynamic nature of the relationship of psychological services and suicidal symptoms.

Relationships between the other types of ancillary services received and depression levels during the first 3 months in treatment varied, with no apparent pattern emerging. The number of services, however, was generally positively related to rates of reported depression symptoms except in methadone programs, where no relationship was observed. Clients' satisfaction with treatment, as expected, was negatively related to reports of depression symptoms.

The substantial decrease in depression symptoms reported during the first month in treatment raises questions concerning the transient or chronic nature of depression as well as the effects of drug abuse treatment on depression symptoms. This preliminary analysis revealed few client characteristics which were related to changes in the rates of reported depression symptoms. The relationships between provision of psychological services and change in depression symptoms were quite varied. More detailed diagnoses of the nature and extent of depression and nature of psychological services need

to be conducted. The TOPS interview data are not specific enough to address the complex clinical questions on the actual dynamics of the therapy or counseling.

PATTERNS AND CORRELATES OF DEPRESSION SYMPTOMS AFTER TREATMENT

The lower levels of suicidal thoughts or attempts achieved during treatment appeared to be maintained after treatment in all the modalities. Although there is substantial improvement, about 10-25 percent of clients still reported suicidal symptoms in all posttreatment periods. Approximately 2-3 percent reported suicide attempts. Thus, although treatment appeared to help reduce depression, depression continued to be a problem for a large number of clients.

As expected, pretreatment suicidal thoughts were the major risk factor. The depression symptom "could not get out of bed" was not related to posttreatment suicidal symptoms. Time in treatment or extent of services was not found to be related to posttreatment suicidal symptoms. Three other risk factors were found, but their importance varied by modality. In OPDF, whites had a higher risk of suicidal symptoms than blacks. Clients in residential and OPDF with three or more prior treatments were also at higher risk for posttreatment suicidal symptoms. Readmission to treatment after TOPS was a significant risk factor for the residential clients. Again, clients from the different modalities appeared to have different risk factors contributing to suicidal symptoms. More detailed knowledge of the course of treatment and the factors that affect that course may suggest more effective approaches to treating depression and suicidal symptoms. These results reemphasize the fact that depression is a serious and chronic problem among individuals abusing drugs.

Research is needed to clarify the relationship between depression and drug abuse and to discover what kinds of treatment may be most effective in alleviating depression in various types of drug abusers. Our findings indicate that depression symptoms faded rapidly for many clients but, at the same time, substantial proportions of clients continued to express symptoms. Further research aimed at the early detection of those whose symptoms are likely to persist would be of great benefit. Other research questions, such as whether depression symptoms motivate clients to seek treatment, whether or how depression is related to specific drug use patterns, and whether or how depression influences the effectiveness of drug abuse treatment also need further investigation.

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APPENDIX

Drug Use Patterns

Using the TOPS data, Bray and his associates* defined seven classes of drug use patterns using the following hierarchical rules. First, a weekly heroin-other-narcotics class was created that included all clients who reported weekly or more frequent use of heroin and weekly or greater use of other narcotics. Next a heroin** weekly class was formed; clients not classified in the prior pattern who used heroin (but not other narcotics) comprised this pattern. Then, an other-narcotics weekly class was created that included clients who reported at least weekly use of other narcotics (but not heroin). Collectively these three classes accounted for everyone who reported weekly or more frequent use of heroin or other narcotics.

The next class (multiple nonnarcotics) included clients who reported using two or more of the following drugs at least weekly: minor tranquilizers, barbiturates/sedatives, amphetamines, and cocaine. The fifth pattern class focused on the remaining clients who used one nonnarcotic at least weekly from the four drug types noted in the prior class. Note both of the latter two classes emphasize use of nonnarcotics without consideration of alcohol or marijuana use.

The next pattern class, alcohol/marijuana, was created from clients who reported using marijuana or alcohol (or both) and no other drugs on at least a weekly basis. Clients still unclassified by the above rules constituted a residual minimal use class (no drugs used weekly or more often). In creating the pattern classifications, it should be noted that the defining characteristics of the classification do not describe all of the drugs used by the clients. Rather they indicate the key drugs and use levels for classification.

The table shows the percentages of the three TOPS cohorts in each of the seven classes. The largest class in all cohorts is heroin. The first three narcotics classes combined account for over half of each cohort. The second largest of the seven classes for the 1979 and 1980 cohorts is alcohol/marijuana, whereas it was the heroin-other-narcotics class for the 1981 cohort. Also, the minimal use (residual) class comprised less than 7 percent of the clients.

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*Robert M. Bray; William E. Schlenger; S. Gail Craddock; Robert L. Hubbard; and J. Valley Rachal. Approaches to the Assessment of Drug Use in the Treatment Outcome Prospective Study, Research Triangle Institute, 1982.

**Because the properties of methadone are quite similar to heroin, the few respondents who used illegal methadone weekly are grouped with heroin users.

Distribution of Seven Pattern Classes
in the TOPS 1979, 1980, and 1981 Cohorts

Pattern Class	Defining Characteristics of Groups[a]	Cohort Prevalence 1979 (n=3389)	1980 (n=3908)	1981 (n=3729)
I. Heroin-Other-Narcotics	Weekly or greater use of heroin or illegal methadone and other narcotics	11.2%	10.3%	15.4%
II. Heroin	Weekly or greater use of heroin or illegal methadone and no use of other narcotics as often as weekly	37.1	33.0	34.0
III. Other narcotics[b]	Weekly or greater use of other narcotics but less than weekly use of heroin/methadone	9.7	12.1	11.6
IV. Multiple non-narcotics[c]	Weekly or greater use of at least two nonnarcotics in addition to marijuana and alcohol use	6.0	6.7	7.4
V. Single non-narcotic[c]	Weekly or greater use of one nonnarcotic in addition to marijuana and alcohol use	10.4	13.5	11.9
VI. Alcohol/ Marijuana	Weekly or greater use of alcohol and/or marijuana. No other drug used as often as weekly.	19.5	17.7	14.2
VII. Minimal (residual)	All remaining clients	6.1	6.7	5.5
		100.0%	100.0%	100.0%

[a]Defining characteristics do not describe all drugs used by these clients. Rather they indicate the key drugs and use levels for classification.

[b]Other narcotics are defined as opioids other than heroin and methadone. Included in this category are codeine, Darvon, Demerol, Dilaudid, morphine, opium, paregoric, Percodan and Talwin.

[c]The nonnarcotics included in constructing this pattern class are barbiturates/sedatives/hypnotics, cocaine, amphetamines, and minor tranquilizers.

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